The Builder.

VOL. XXVI.—No. 1330.

*Memorials of Old London and Old London Life.**

THE Corporation of London has just made a delightsome gift to the public. It has placed the early archives of the City of London in the hands of Mr. H. T. Riley for selection, translation, and publication of all passages that give any presentment of London in the thirteenth, fourteenth, and fifteenth centuries, or any details of London life in those times; and in so doing this august body has made the public free, as it were, for ever, of some of its choicest possessions. The Corporation has opened the City gates, and invited the public into old London, the London of the Plantagenets; of Wat Tyler and Walworth; of Geoffrey Chaucer; the London of Queen Eleanor, of Queen Isabel, of Queen Philippa; of the Fair Maid of Kent; the London of Dick Whittington, paved with gold, in truth, if not literally.

Let us enter gratefully, observantly, correspondingly. It is the reign of Edward I. Each city gate is kept by two sergeants, "skilful men and fluent of speech," who carefully note, all day, who passes in and out, so that no harm shall befall the City. At the ringing of curfew every gate is shut and secured: all the taverns, too, for the sale of wine and ale are closed at this signal; and no one is allowed to go about the streets or ways after this hour. The skilful sergeants betake themselves to their lodgings, which are either within the gates or close by; and then into the silent and deserted streets turn six of the most "competent" men of every ward to watch and guard their district throughout the hours of the night. All the boats on the river are moored on the City side at night; the sergeants of Billingsgate and Queen Hythe take note of the name of every one of them; and each of these officers has a boat of his own, and provides four men to guard the river by night, on both sides of the bridge. You can hear the lapping of the water, as though the black shadows upon it are sighing to be free; for no one is allowed to cross the Thames by night.

But when we enter it is noon. There are little boxes, or stands, in the streets for the sale of wares, piles of timber lie here and there, and pigs stray about; but these inconveniences are not to be endured after "Monday next," so we will not dwell upon them. Here is a knot of men at work clearing the water-course of Wallbrook; and close by them an alderman is passing, accompanied by two of the best men in his ward, on a house-to-house visitation and survey of the hostries, or hostels, in his ward, so that he may be informed of the exact number, quality, and calling of every person in his division of the City, of twelve years of age and upwards. In sight, at the same time, is a female wearing a hood and cape furred with minever, who regards, somewhat contemptuously, a woman of a lower grade, who has also draped herself in a similar garment; and she is evidently determining to move heaven and earth in her aldermanic circle to get an enactment made that regratresses, or women who sell wares by retail, and servants should be limited to the use of lamb-skin and rabbit-skin decorations for their hoods. There is a little crowd opposite the church of St. Martin. We peep between the elbows or over the heads of the throng, and see that "one Matilda, wife of Henry le Coffeur," coming from West Chepe, has fallen upon the pavement and broken her arm. The little crowd declares that she is drunk, but, nevertheless, she is carried tenderly to her husband's house to languish and die. The men who carry her and the mixed group that accompany them talk of other accidents that have recently occurred as they go. They tell how, on the Eve of St. John, a man was found lying drowned in the Foss under the City wall, near the Tower, Portsoken, and his coat of russet picked up on the ground close by, and suggest that he went to bathe there without knowing how deep the water was, and sank never to rise. No one knew his name, or whence he came. Adam Schot's case is called to mind. He was the servant of Ponce de More, and climbing up a pear-tree in the garden of one Laurence, in the parish of St. Michael, Paternoster Chirche, for the purpose of gathering pears, a branch broke beneath his weight, and, falling to the ground, his body was almost burst asunder. He died three days afterwards, and the pear-tree was appraised at five shillings; and Ponce de More and the next-door neighbours on both sides were attached by sureties. Then they tell how John de Hancrete was burnt to death a few nights before, through taking a lighted candle with him to his straw bed, and falling asleep before he extinguished it; how Henry de Flegge was drowned when he took his horse to water in the dock of the ward of Castle Baynard; how John Fuetard was killed by John le Clerk when playing together at "tiles," by an accidental blow on the side of his head; and how other deaths had occurred by misadventure all within a few weeks. As the little sympathising procession turns into the ward of Anterkin de Auvergne, where Henry le Coffeur lives, we lose sight of it. There is another crowd before the doors of the Church of St Paul. Let us see what is the matter here. One Walter Bacun has taken sanctuary within the church. The coroner of our Lord the King, William le Mazeliner, accompanied by the warden of the city of London, John le Breton, John de Banquelle, Baroncin, and other trustworthy persons, has come to demand the reason why he has done so. The refugee confronts the magnates. He is a forlorn, repentant parish priest, who confesses that he has stolen sixteen silver dishes that belong to Sir Baroncin. Passing from the curiosity of this scene of humiliation into the streets, we note the stations, or stands, for stalls, clustering round the high cross of Chepe and the broken cross, all kept by women, the pent-houses, haut-paces, and signs. Some of the pent-houses are so low and project so much as to obstruct the roadway for people on horseback; the haut-paces, or rooms built on pillars, have their disadvantages too, for the spaces below them serve as harbourage for idle persons; and we feel that both inventions will have to be swept away. Here is the house of Roger Brewere. It is known as the "Maiden en la Hope" (the Maiden in the Hoop). Here is the tenement known as "Horshed," and "Sarazineshed," that Peter Fanelore and two others bestowed upon the chantry in the chapel of St. Mary, near the Guildhall. Here is a hostel with the sign of a lion on a hoop. In Estchepe there is the "Belle on the Hope" (made famous not long after this as the hostel where William Frenkysshe passed himself off as the son of the Earl of Ormond upon John Tylneye, of the county of Norfolk, and induced him to part with "divers lands" and other good things upon the understanding that his little daughter Katherine, then seven years of age, should some day be his countess; for which magnificent lie the said William was put in the pillory for three hours, with a whetstone hanging from his neck, and then cast into Newgate until he could satisfy the deluded John). We observe among the signs less graceful combinations with the hoop than the maiden and the belle. Here is "Le Walssheman sur le Hoope;" and here are the "Kay sur le Hoope" and the "Sterre on the Hoope." In Chepe we recognise the seedlings of future high-storied piles in the selds, or silds, warehouses, or bazaars, which are used for the stowage of goods, and sometimes as centres for the sale of particular wares. They are let out in rooms furnished with aumbries and chests secured with locks, as well as in shops, to different merchants. This large seld in Westcheape, in the Mercery, belongs to the Lady Roisia of Coventre. Ten melters, or chandlers, have selds in Chepe; and they are much disturbed because they have all received notice to remove the merchandizes touching their trade from them, and provide themselves with premises elsewhere. This is the Spicery. In Fryday-strete stands the tanners' seld, where the tanners transact all their business. Foreign tanners coming to sell their hides pay one penny for every ten sold; and a pretty clamour the owner, Adam Lovekyn, is making, because he has heard one of his trade has been selling hides in secret at his hostel; and another has presumed to sell some in the street, instead of in the seld, whereby he is twopence short. In the ward of Brade-strete a knot of men are looking anxiously at an elm growing by London-wall, near Bisshopesgate, and prophesying that it is too old and dry to last long, and that if it be not taken down it will be the worse for the shops of Roger Poyntel opposite.

Mr. Riley has not confined his pen to the extracts from the Edwardian archives that show us these things. In a careful and elaborate introduction, he draws attention to arrays of facts that could only have been made by one who has been over the whole field, and systematically grouped his gleanings. The topography of old London he traces. He has gathered together mention of all the old gates, streets, lanes, and wards, so that we are able to see somewhat of the localities of the homes whence the citizens flocked to Westminster, to see the coronation of Edward I., and his brave and tender queen, Alianor. He has grouped the surnames in classes, adding to those derived from trades many that have escaped other collectors. Among names from trades are Henry the Wympler, wimple-maker; William the Oynter, melter of grease, or chandler; Andrew the Horsmonger; John the Marberer, sculptor perhaps; Simon the Fannere; Richard the Fruter; Geoffrey the Brochere, spit-maker. Then we read of oystermongers, knyfsmyths, malemongers, sellers of mails or travelling bags, chalicers, otemongers, bredemongesteres, and other old names for trades we should scarcely recognise in their early guise but for the translator's identification. There were some people called "peters," who brought fish to the City, and were ordered to stand in Chepe with their fish, and nowhere else. Again Mr. Riley points out that Saxon Christian names had disappeared from the face of the City with

* Memorials of London and London Life in the Thirteenth, Fourteenth, and Fifteenth Centuries. Being a series of extracts, local, social, and political, from the early archives of the City of London, A.D. 1276—1419. Selected, translated, and edited by Henry Thomas Riley, M.A. of Corpus Christi College, Cambridge; and of the Inner Temple, Barrister-at-Law. Published by order of the Corporation of London, under the superintendence of the Library Committee. London: Longmans, Green, & Co. 1868.

but very few exceptions, although three centuries had not elapsed since the Conquest; the king upon the throne bore the almost solitary Saxon name that had survived through the interval. He says, "The name most in favour with the London population was undoubtedly that of John, and probably those of William and Thomas held the second and third places. In the list of the first common council chosen for the City, A.D. 1347, 133 in number, we find thirty-four members with that name, seventeen called 'William,' fifteen 'Thomas,' ten 'Richard,' eight 'Robert,' and eight 'Henry;' in the whole list not one Edward or Edmund, or other Saxon or Christian name, Radulf (or Ralph) excepted, is to be found." Among the women-folk Johanna, or Joan, was the favourite name, and Cristina the next in approval. Only the rich took upon themselves to call their daughters Mary. While this familiar appellation was thus esteemed, Isabel, Matilda, Juliana, Aleson (Alice), Lucy, Petronilla, then rendered Pernel and Parnel, Agnes, Idonia, and Avice were common. In the nine treasured volumes consulted by our author only Godiyeva (Godiva) recalled to him that a race of fair Saxon women had ever lived on the soil. He has found several clues that lead to fresh information concerning the three names, either of which would have made any city famous, and all of which belong to London and these old times, Chaucer, Walworth, and Whittington.

Chaucer was the French term then in use for shoemaker. This name is mentioned nearly a score of times in the old City books, beginning with Stephen, a chaucer, who was a surety for William de Clay, in 1281, including Richard le Chaucer, vintner, identified as the father of our early poet, and ending with Thomas Chaucer, chief butler to Henry IV. and coroner *ex officio* in 1403, one of the two sons of Geoffery Chaucer. And besides these glimpses of the poet and his ancestors, there is the copy of a lease granted by the mayor, aldermen, and commonalty of London to the immortal Geoffrey, of "the whole of the dwelling-house above the gate of Algate, with the rooms built over, and a certain cellar beneath, the same gate, on the south side of that gate, and the appurtenances thereof," for life, in which the poet undertakes to occupy it himself, and keep it in repair "for the whole life of him." The mayor makes a reservation of right to enter the said rooms in time of defence of the city, and to order and dispose of them as may be deemed expedient at that time. This was in "the forty-eighth year of the reign of King Edward, after the Conquest the Third." The name of Walworth does not occur till an entry is made, in 1368, that the subsequently famous Sir William was elected alderman of Bridge Ward. "He had been," says our authority, "apprentice and probably manager of the business of John Lovekyn, stock fishmonger, and until then had to all appearance taken no part in City matters." In 1370 he was sheriff, at which time the City was in great excitement, expecting an attack from a multitude of armed men then in certain galleys lying off the Foreland of Tenet (the North Foreland), and forty men-at-arms and sixty archers kept watch at night between the Tower of London and Byllyngesgate; which watch, by agreement, was kept by the Drapers and Tailors on Tuesdays, the Mercers and Apothecaries on Wednesdays, the Fishmongers and Butchers on Thursdays, the Pelterers and Vintners on Fridays, the Goldsmiths and Sadlers on Saturdays, the Ironmongers, Armourers, and Cutlers on Sundays, and the Sawyers, Spurriers, Bowyers, and Girdlers on Mondays, much to the hebdomadal discomfort, doubtless, of every tradesman's house in the City. There is an entry, dated 1374, of the fact that William Walworth was then elected Mayor. As a temporary enactment was made disallowing aldermen from serving two years in succession, he was superseded in 1377 and re-elected in 1378; again superseded in 1379 and re-elected in 1380. William Walworth does not seem to have spent his days in peace. In the month of June in the third year after the accession of the young king with whom his name was ever afterwards to be associated, one Alice, wife of Robert Godrich, came to his house, in the parish of St. Michael, Crooked-lane, and there "did horribly raise the hue and cry upon the said William," declaring he was a thief, and had unjustly disinherited her of 20*l.* value of land yearly and cast her husband into prison. He prosecuted her for this slander; but when he heard she was sentenced to the pillory, called the "thewe," there to stand for an hour with a whetstone hung from her neck, as well as to pay him forty pounds for the damage done by her slander, his indignation was succeeded by mercy, and mercy by pity. He presented himself before the Court, "begging and entreating the Mayor and Aldermen that the punishment of the pillory might be remitted to the same Alice; upon which, at his request, such punishment of the pillory was remitted. And as to the sum of money so adjudged to the said William, he asked that payment thereof might be put in respite, during the good behaviour of the same Alice, and that she might be released from prison, and accordingly at such request she was released." All the more sunny and pleasant did Crooked-lane look that June evening as the brave William wended his way homewards after his forgiveness and intercession, we may be sure; and mute was the tongue that had reviled him, we may be sure too. There is an account of the part he played in the insurrection of Wat Tyler in the June of the following year, which was written, says the City scribe, that this most wondrous and hitherto unheard-of prodigy that ever happened in the City of London might not be unknown to those to come. There are some facts in it that have not been given in other accounts. When the king rode out from the Tower to "Mileende," to meet the countless companies of Commoners from Kent and Essex, the Princess Johanna, his mother, accompanied him in a chariot, besides the knights, squires, and citizens on horseback usually mentioned. And after "the most renowned man" had killed "Walter Tylere," in Smithfield, this account says that he so defended himself that "he departed from thence unhurt and rode on with our Lord the King and his people towards a field near to the spring that is called Whittewellebeche; in which place, while the whole of the infuriated multitude in warlike manner was making ready against our lord the king and his people, refusing to treat of peace except on condition that they should first have the head of the said mayor, the mayor himself, who had gone into the City at the instance of our lord the king, in the space of half an hour sent and led forth therefrom so great a force of citizen warriors in aid of his lord the king, that the whole multitude of madmen was surrounded and hemmed in, and not one of them would have escaped if our lord the king had not commanded them to be gone." The first mention of the mayor after he was knighted on the field, on this occasion, beneath the king's standard, occurs within a month in a grant of lease to build a hautpas, or halpace, to Sir Robert Knolles and Constance his wife. The mayor, aldermen, and commonalty of London gave the said Messire Robert and "Custance" his wife leave to make a hautpas, 14 ft. high, extending from the west side of their house to another one belonging to them on the east of it, for which privilege they were to give the chamberlain of the Guildhall a red rose, every year, at the feast of St. John, and in witness whereof the common seal of the City was set to the letters patent, Messire William Walworthe, knight, being then mayor. This Sir Robert was one of the brave knights who figure upon the pages of Froissart.

Dick Whittington was a London citizen when Walworth thus distinguished himself. The first mention of his name occurs in 1379, in a list of contributors to a City loan. His fortune was then, we presume, but in the course of being made, as he lent but five marks, as did about four-fifths of the subscribers; whereas the Mayor, John Philipot, lent 10*l.*, and William Walworth 5*l.* We next catch sight of him in the City streets, as one of the eight common councilmen for Coleman-street Ward. Nine years after his loan of five marks he is named as surety to the chamberlain for the sum of 10*l.* towards the cost of defending the City. By this time he figures as one of the twenty-four most substantial commoners in the City. In 1393 he was chosen alderman of Broad-street Ward; and the mayor selected him for sheriff in the same year. When Adam Bamme went the way of all flesh during his mayoralty, the king decreed, with the assent and advice of his council, that his well-beloved Richard Whityngtone should be mayor and escheator until the accustomed day of the next election; and when that day came, he was, by common consent, elected mayor for the following year, 1398. We may trace out some of the business that occupied his thoughts and filled his remembrance. In this year of office new ordinances were made for the leather-sellers full of restrictions; John Sewall was imprisoned in the gaol of Newgate for saying to Richard Hawtyn, in the church of St. Martin-le-Grand, that there had been neither peace nor love in England since the king reigned; new ordinances were made for the hurers, who had then fallen into the habit of sending "their apprentices and journeymen, as well children of tender age as others, down to the water of Thames and other exposed places, and amid horrible tempests, froste, and snows, to the very great scandal of the good folks of the said trade," to scour "cappes" or "hures," and were no longer to be permitted to do any "scouring" out of their own houses, nor to work on any feast-day or upon the "Eve of an Eve," nor on any Saturday after the last peal of vespers; and a mart was opened for the sale of broad-cloths on the site of the present Bankruptcy Court and Guildhall Buildings, for which ordinances were also made. A thrill of horror went through the City on the murder of one of its wealthy citizens, who was treacherously slain at Winchester, as set down in a valuation of the precious stones and plate found in his shop on Cornhill, appraised at 600*l.* 3*s.* 6*d.* In 1406 Richard was again elected mayor. The details of this election are given with great minuteness, the selection being attributed to divine inspiration, and a mass of the Holy Spirit for the guidance of elections in future years was ordered to be performed annually in the chapel of the Guildhall. In 1411, Richard Whityngtone, citizen and mercer of London, granted a piece of land for the rebuilding of the church of St. Michael, then "too small, frail, and ruinous." But this prosperity, public spirit, and liberality did not save him from detractors. As in the case of William Walworth, the tongue that said the bitterest things against him most openly was that of a woman. His slanderess was Johanna Hert, who came before the mayor, recorder, and sheriffs, and declared that she had often defamed Richard, saying he owed her very large sums of money, and detained goods and jewels of hers to the value of many thousand marks, all of which statements were false, the fact being that the accounts between them were strictly balanced, and if any difference remained she owed more to the same Richard than he owed to her. Whether she was sentenced to the pillory, like the mad-speeched Alice Godrich, does not appear, as the record abruptly ends with the declaration of her falsehood. There was another king upon the throne, when the famous voices of the bells came true, and Whittington was thrice Lord Mayor of London. Henry V. had captured Harfleur, and had fought the battle of Agincourt; the building of the new Guildhall had progressed; various improvements had been made in the City; the halpaces at St. Martin-le-grand removed, the little postern in the City wall newly built up, the City moor laid out in gardens, the banks of the fosse at Walbroke piled, the watercourse at Oystergate diverted and put into better condition, and several other steps made in sanitary matters. By this time an order was in force which forbade the granting of the dwelling-houses above the City gates to any persons in consequence of the damage the gates, walls, and fosses sustained when they were occupied. The Plantagenet writings the Corporation has placed before us show us that these old days were busy times. The people were not always in holiday dress, hanging out gay draperies from their windows as demonstrations of joy, attending mass, feasting, or waiting about in great crowds to see triumphal returns of princes from foreign victories. The butchers and fish-curers seem to have been always filling the kennels with blood and filth, the brewers always drawing water from the pipes of the public conduits for their brewing, the hurers always scouring in the streets, the strumpets industriously aping the dress and especially the furs of honest women, the cap-makers never proof against the temptation to make caps contrary to the mode stipulated and often doomed to see them burnt in Chepe in consequence; the men in most other trades, too, prone to break the stringent rules and sure to be pilloried or otherwise punished for so doing; for enactments relating to these offences have been repeated over and over again at intervals. There seem, too, to have been a longing and determination to extend the hours of business which were always being jealously reduced to a minimum; frequent attempts to buy and sell in other places besides those arbitrarily appointed; a natural taste for giving bad measure and short lengths, and adulteration, that was always being weeded out; an inkling after Sunday trading, first indulged in by the barbers of London, but severely reproved by the Archbishop of Canterbury; an intention

to sell putrid fish, flesh, and fowl that was rigorously punished as often as detected; an irrepressible craving to curse and slander the aldermen, which sometimes, in a fainter degree, extended to the mayor; a desire to strip and bathe in the fosses that was not allowed to be gratified; a habit of throwing dirty water from the windows instead of bringing it down to the ground below and putting it into the kennel; some drunkenness; a little child-stealing; but among the most substantial reputable people an abhorrence of all wrong-doing; for there are references to all these things. For the rest, the citizens seem to have come and gone, concreted and dispersed as incessantly then as they do now. This pervading presentment of active life, industry, swift passing to and fro, laying up of treasures and parting with them, is artistically and truthfully indicated in the following passage by Mr. Riley:—

"So far as the details of middle-class and low life, in those times, passed within the walls of a city, are concerned, hardly a feature perhaps can be suggested that in these pages is not, in some way or other, incidentally brought under notice. Among the more prominent may be mentioned,—the rules and usages of various trades and crafts, surgery being included in the latter, and the province mainly of the barbers; inventories of personal property of every description, from jewelry and plate down to pots and pans, kettles and old clothes; the stocks of the City shops; the tackle of shipping; the munitions of war; the roofings of houses; the supply of fuel; the regulations of the markets; the fees of the clergy; the times for curfew; setting the watch; the dangers of the night; the rates of wages; the tricks of trade; the devices for protection then as stark-mad, to all appearance, on the side of the master, as it is now on the side of the man; the impostures of soothsayers and professors of the magic art; and the arts and frauds of the mendicants, swindlers, and sharpers, with as large a per-centage of whom the streets of London were probably then beset as they are at the present day."

Everywhere it is not so much the great ones of the land that we see before us as the mass of the people. When King Edward sends word of his victory over the Scots at Falkeld, it is not the most knightly monarch we see so plainly as the citizens who receive the intelligence, and give 26*s.* to the tired messenger. When Queen Isabel sends word of the birth of her first son at Windsor, it is not the proud young royal mother we see so well as the civic circle who rejoiced upon the occasion, carolling, and passing through the City with a great glare of torches and blaze of trumpets, and who on the Wednesday following gave John de Phalaise, the queen's tailor, who brought the letter, ten pounds sterling, and a cup of silver, weighing 32 ounces, which present the same John sent back on the Thursday, deeming it too small. We do not see so much of the Black Prince, notwithstanding there is a somewhat specious letter from him shown us, as we do of the excited crowd that went out to greet him on his return from France. In the same way we are impressed more with the procession of the mayor and citizens to Westminster, on foot, to return thanks in the glorious abbey, after the battle of Agincourt, rather than with the fact that the queen was there too rejoicing. The "Memorials" are of the people and for the people. Often is the prince indebted to the people in these pages. Four times the royal jewels were sent to the City as security for large loans; and several times munificent presents were bought by the City magnates and presented to royalty. A present to the Black Prince consisted of hundredweights of silver plate, of which the inventory is given. Doubtless the princes were brave soldiers, mighty leaders, and magnificent representatives of authority. So were the citizens brave, mighty, and magnificent, too; and the corporation, especially, a grand, dignified, just-dealing, generous body.

Here is a specification of one of the timber houses built in the reign of Edward II.—2 Edward II. A.D. 1308. Letter-book c., fol. xcvi. (Latin):—

"Simon de Canterbury, carpenter, came before the Mayor and Aldermen on the Saturday next after the Feast of St. Martin, Bishop [11th of November], in the second year of the reign of King Edward, son of King Edward, and acknowledged that he would make, at his own proper charges, down to the locks, for William de Hanigtone, pelterer, before the Feast of Easter then next ensuing, a hall and a room with a chimney, and one larder between the said hall and room; and one sollar [sun-parlour, or upper room] over the room and larder; also one oriole [probably bay-window] at the end of the hall, beyond the high bench, and one step with an oriole [porch?] from the ground to the door of the hall aforesaid, outside of that hall; and two enclosures as cellars, opposite to each other, beneath the hall; and one enclosure for a sewer, with two pipes leading to the same sewer; and one stable [space left for dimensions which are not given], in length, between the said hall and the old kitchen, and 12 ft. in width, with a sollar above such stable, and a garret above the sollar aforesaid; and at one end of such sollar there is to be a kitchen with a chimney, and there is to be an oriole between the said hall and the old chamber, 8 ft. in width. And if he shall not do so then he admits, &c.

And the said William de Hanigtone acknowledged that he was bound to pay to Simon before mentioned, for the work aforesaid, the sum of 9*l.* 5*s.* 4*d.* sterling, half a hundred of Eastern marten skins, fur for a woman's hood, value five shillings, and fur for a robe of him, the said Simon, &c."

Did the honest Simon's true-love, or dame, look with favour upon the fur for her hood thus bargained for, and with kindness upon the donor, who gave his labour, skill, and timber for it? And was Dame Hanigtone content with her summer-parlour, her new kitchen and cool larder? Was the view from the bay-windows that which charmed or vexed her? Could she see the processions of the mayor, aldermen, and commonalty from them? Did she see the messenger ride away with a present from the City of a thousand marks for the king, in aid of his war in Scotland? Did she hear the proclamation that the tailors should not scour furs in Chepe? Or see William de Croton in the pillory, for pretending to be one of the City sergeants, and stopping the carts of Richolda & Mabel, bakeresses, of Stratford, and exacting 10d. from them by this false pretence? Could she see the people bathing in the fosses of the Tower, or in the other fosses near the Tower, or in the Thames, and was she as vexed with them as the king was, and declare she would have them put to death, as he did?

Here is the agreement of Adam le Plastrer for plastering the hall of John de Bretagne, Earl of Richmond, grandson of Henry III., dated A.D. 1317:—

"Know all men that I, Adam le Plastrer, citizen of London, am held bound and obligated to Sir John de Bretagne, Earl of Richmond, to find plaster of Paris, at my own proper charges, good and sufficient, without default, proper for the hall of the said earl; and also that I will competently, at my own proper charges, plaster and complete the said hall, and will repair the walls of the same with the said plaster, well and befitt ngly within and without; as also the tewels, to the summit, in such manner as befits the repair of the hall aforesaid; and this I will do for 24 pounds sterling, which our Lord the said Earl has paid to me beforehand. Faithfully to perform the which work within eight weeks from the day of the Holy Trinity next ensuing; I do bind myself and all my goods, moveable and immoveable, namely, my lands, houses, and tenements, within the city of London being, to distress on part of any bailiff of our Lord the King, &c., into whose hands soever the same may have come, for enforcing observance of all and singular the premises. In testimony whereof, &c. Given at London, on the Thursday next, before the feast of Pentecost, in the 10th year of the reign of King Edward, son of King Edward."

Did Adam get his prepaid task accomplished in time? Did the earl's mother, the Lady Beatrix, busy herself and maidens with tapestry to cover the newly plastered walls of the principal rooms? Or did the earl purchase for his renovated hall the piece of cloth eight ells long and six ells wide, which Aleyse Darcy embroidered, with divers works in gold and silk, after she had finished one of a similar description for the Earl of Lincoln, as described in the transcript of a quit claim about this time?

Reluctantly, we confine ourselves to one more extract. Mr. Riley has drawn attention to an acknowledgment which contains a distinct allusion to the materials used for varnish-painting upon canvas, more than a century before the time of John Van Eyck, who is often accredited with its invention.

"On Friday, the Eve of St. Botolph [17 June], in the 12th year of the reign of King Edward [the First], Nicholas Bacun, painter, acknowledged that he was bound to Hugh Motun [the City chamberlain], in the sum of 20 shillings, for cinople [a green colour], vermilion and canvas, varnish and verdigris; the same to be paid to the same Hugh or his certain attorney, 10 shillings at the Feast of St. Bartholomew [24 August], and 10 shillings at the Feast of St. Michael [29 Sept.], without further delay."

Throughout the volume, Mr. Riley has translated *mestera* and *mestier* trade and craft, in preference to "mystery." He states that as these words are derived from the Latin *ministerium*, a serving to, and are not in any way connected with *mysterium*, a secret, this rendering is less likely to mislead the purely English reader than the use of the old-fashioned word "mystery" or "mistery."

We have referred to the new works at the Guildhall. There are three memoranda relating to them. From these we gather that the building now standing, which is situated a little to the west of the former structure, was commenced in the mayoralty of Thomas Knolles, A.D. 1410, and that three years afterwards the funds were exhausted; upon which a council was held in the upper chamber of the Guildhall, and various fees and fines allotted for the support of the work for the next six years. Every apprentice, male and female, on entrance, was to pay 2*s.* 6*d.*, and 3*s.* 4*d.* more at the close of the apprenticeship; for every deed that was enrolled an extra fee was to be charged for the good of the work; every will, every letter patent, was to pay a fee over and above the usual charge; several fines and amercements were also appointed to be set apart for this purpose; and a 100 marks sterling out of the revenues of London Bridge were to be given for six years towards the prosecution of the works. This was in the year in which Henry IV. was succeeded by Henry V. The next entry was made in the first year of the reign of the last-mentioned monarch, setting forth that the two carts belonging to Henry Cook, carter, were not to be taken by the sheriffs for any other work, as they were engaged upon the service of the new work at the Guildhall. The last notice of this building is dated in the seventh year of the same king, when an enactment was made that the duty for scavage, or showing of goods, should be applied to the funds; and that Thomas Pike should contribute to the new work three years' arrears due from him. When Edward III. was re-building Westminster Palace so many workmen and labourers withdrew from his works that he issued a proclamation that no one was to employ them under penalty of being sent to the Tower; but no difficulty with the men is recorded to have taken place here. This smooth-sailing was, perhaps, due to the observance of certain articles drawn up by the trade, which we are about to notice.

About three years after the "strike" at Westminster the Corporation took the masons in hand. Solid, hard-handed, slow-thinking men they were, not particular about such trifles as the way their names were spelt, or whether they had any surnames at all; though not clumsy; very precise over the way they did their work, and determined that no one should do it in any other fashion. The mason hewers set themselves against the light masons and setters, and their disputes seem to have been very frequent and tiresome, when the mayor undertook to investigate their case. He attributed their dissentions to the fact that their trade was not regulated "by the government of folks of their trade," and agreed to receive twelve of their representatives, who should draw up a code of articles by which, for the future, it should be ordered and ruled. Six masons on behalf of the hewers, and six on behalf of the light masons and setters attended this conference. The regulations, which were drawn up in Norman-French, were briefly these:—Every man might work in any branch of the trade if skilful at it; "good-folks" were to be chosen and sworn to see that no mason undertook work that he was not able to do, under penalty of fine and expulsion. No one was to take work in gross (wholesale or by contract) if he had not ability to complete it in a proper manner. He who did undertake such work in gross was to take with him to the employer six, or four, ancient men of the trade to testify that he was able to perform it, and take upon themselves the responsibility of finishing it if he should prove unable to do so. No one was to set an apprentice or journeyman to work, except in presence of his master, before he was perfectly instructed. No one was to take an apprentice for less than seven years. The masters that were chosen to superintend the trade were to oversee that those who worked by the day took for their hire what their work was worth, and asked no outrageous pay. If any objected to be ruled by these persons his name was to be reported to the mayor, who, with the consent of the aldermen and sheriffs, would imprison or otherwise punish him, "that so other rebels may take example by him, to be ruled by the good folks of their trade;" and, finally, no one was to take the apprentice or journeyman of another, to his prejudice or damage, until the expiration of their term, under penalty of half a mark for each conviction.

We close this recording volume in the same mood as that in which these Edwardian masons must have left the conference, much gratified with the wide courtesy and wise consideration of the corporation.

Improvement of Park-lane.—In reply to Mr. Labouchere, in the Commons, Colonel Hogg has intimated that the Metropolitan Board of Works have referred the subject of widening Park-lane to their surveyor, and they hope to be able, provided the expense is not too great, to carry out as far as possible the recommendations of the committee of the House on the subject.

RESERVOIRS AND WATER SUPPLY.

In a former number of our journal* we promised to revert to the subject of the collecting and storage of water on a large and comprehensive scale, in sound and well-constructed reservoirs, so that the future water supply of our largely increasing population might be placed on a sure and permanent basis, and that we should not continue on the present short-sighted system working just as it were from hand to mouth, as appears so self-evident to all those who have observed and investigated the subject; and the present moment seems to us the proper time for drawing public attention more particularly to this important question, as the shortness and inefficient character of the supply are being felt in many of our populous places and these difficulties will continue to arise unless we have the spirit, the enterprise, and determination to grapple with the subject, and to place it at once on a broader, more general, and permanent basis.

As we are just now investigating the subject matter of the water supply of towns and the pollution of rivers by means of royal commissions, the time is very opportune for pressing this momentous question home,—momentous as far as the wants and necessities of our towns and rural populations are concerned, as in the present day, with all our boasted advantages of superior culture and civilization, we lack many of the conveniences and sanitary provisions ancient leading nations had placed for the advantages of their populations, and ours scarcely merit the appellations so freely bestowed in laudation of the enterprise, the pioneering principle, and the prestige of the Anglo-Saxon.

The necessity for a thorough investigation into the system of the general water supply of the country is now beginning to force itself upon public attention, as every year application is being made to Parliament to extend and amend Acts for the water supply of our large and populous towns, attended with the heavy expenses usual on such occasions, and the session now just ending has had many such applications, which an earlier comprehensive, preliminary, and exhaustive inquiry would have rendered unnecessary, and thus much of this further expenditure would have been saved.

In the absence of railway speculations, and the utter want of spirit or confidence in the money market, complete panic, chaos, and prostration have fallen on those enterprising individuals who usually profit so largely by the various schemes which the ease or gullibility of John Bull enabled them to float upon the capitalists of the country in the shape of "limited liability," and this collapse may turn their speculative theories into more social channels, and water supply works and similar works may take the place of railways. The manner in which the information was obtained from the provinces by the Water Supply Commission relative to the present or future water supply of the respective localities does not appear to have been very good, and the information obtained will doubtless turn out to be one-sided and *ex parte*: the usual plan appears to be to summon the local surveyor or engineer, and two or three other officials, through which channels of information it is supposed will be elicited pure and unadulterated streams of knowledge bearing upon the sanitary state and conditions of the respective towns they represent, and the principle of calling opposing parties has not been entertained, so that the Commission could separate the wheat from the chaff, and thus from the happy medium draw their well-considered conclusions.

We dare say that when the report appears the town authorities will not have omitted the opportunity to paint everything *couleur de rose*, as was the wont to do previously to 1845, until the indefatigable Chadwick, followed up by the "Health of Towns Commission" and the *Builder*, rooted out and exposed the barbarous abominations of our towns, which so astonished and shocked the nation at large, and which educated and prepared them for that large measure of sanitary reform which culminated in the Public Health and other cleansing and purifying Acts. The necessity of an ample supply of water in all seasons to every place is now considered to be so generally necessary, that few will venture to dispute the point when argued publicly or on public grounds; and yet it frequently happens there are found water companies, and even Boards of Health, who act precisely on the contrary principle, and who endeavour to reduce or stint the supply, and place difficulties in the way of the public obtaining it, even where that necessary of life exists in comparative abundance. Their main object appears to be, to see how small a quantity of water will supply a population, or how great a pecuniary benefit may be derived from water eked and doled out as if the drops of water were veritable bits of money, to be applied upon the closest and most niggardly scale, and to the fewest possible individuals, forgetting that the leading, vital, and ruling principles of the present day are free trade, low fares on railways, low rates of water supply, and other sanitary arrangements compatible with the utmost efficiency of the works and the public benefit.

Having prefaced our remarks on reservoirs with these few general observations, we will now proceed to introduce the question of site and other subject matter incidental to the proper construction of such works.

The Site.—Great care and judgment are necessary in the selection of a site for a reservoir. The first point to be considered is the situation; that is, if the locality is convenient and suitable in all respects for the proposed works, and has a sufficient extent of area of gathering-ground draining towards it, to keep it at all times well and regularly supplied with water; and this capability of supply must be ascertained by a series of meteorological observations on the rainfall, by gauging from time to time the various streams that intersect the drainage area, and by careful admeasurements and calculations of the extent of the area and the average amount of the water produced by the rainfall, springs, &c., during a lengthened period of time, and particularly during dry seasons.

This very necessary information is not at all times sufficiently sought after and attended to. The sites frequently selected are in deep and narrow valleys, generally high above the summit level of the district to be supplied, so as to enable the water to flow by its own gravitation to the houses of the consumers; and reservoirs are generally formed by throwing an earthen dam or one of masonry across the narrowest part of the valley, so as to impound the water in the readiest, most secure, and efficient way.

The object to be obtained in this case is to collect the largest volume of water, and at the same time to present the smallest area of evaporating surface, and at the least amount of cost for the construction of the works.

The injurious action of the atmosphere on still and shallow water has induced the construction of reservoirs with great depths of water, and with necessarily deep embankments to hold it up. These afford the least possible space for the action of the atmosphere, either for evaporation or for impurities, and this has led to the making of many reservoirs of large capacity as regards depth, the embankments of which have been carried up, it appears, in many cases to the very verge of, if not beyond the limit of safety, and requiring the utmost skill, experience, and judgment of the engineer in their construction.

Another point to be considered is as to the desirability of the situation. The stratum over the area of the proposed reservoir should be a close, clayey, retentive earth, so as to require as little puddle lining as possible, and also a sound and impermeable foundation is required for the seat of the embankment, to carry the weight of the superincumbent earth forming it, and one that is free from any faults, springs, soaks, &c., not liable to slip from any peculiarity of the geological formation or dip of the strata, from compressibility, or any other cause.

And this, of course, leads us to the absolute necessity of a strict and thorough geological survey of the strata of earth over the whole area of the proposed reservoir, and more particularly of the seat of the embankment; and boring, therefore, must be resorted to, carefully made, and strictly examined, and the results thoroughly investigated and tested.

We have had so many reservoirs fail, as we presume, from a neglect of these very necessary preliminary inquiries, this essential elementary knowledge, that the wonder is that it should have escaped the critical investigation of those discerning men from whom the design of the works emanated. And it may not be considered invidious if we enumerate a few of those works where failures of more or less magnitude have taken place, in some places attended with most serious consequences, as critical allusions and investigations of failures are often attended with advantages to future works. The places alluded to are Manchester, Bradford, Oldham, Sheffield, Dublin, and some other places of lesser note and importance.

The Design.—A suitable and efficient site having been secured, another important question is the design, as it is equally important as the selection of a sound and watertight stratum: the shaping of the structure, and apportioning the respective parts so that they shall be more than fully equal to the pressures and strains that may be brought to bear, are important elements to be considered, and to make ample allowances for.

The section of a dam-head should depend entirely upon the depth and weight of water it has to hold up and sustain; that is, supposing all other conditions of site, foundations, strata, &c., are perfect and unobjectionable; and to resist that weight of water resting against the banks there must be more than an equivalent weight of earth to resist or counterbalance it.

For instance, the vertical pressure of water on the bottom of a reservoir per square foot is equal to 62·5 lb. multiplied by the depth of water, and this for 100 ft. deep is equal to 62,500 lb. per square foot of the surface.

But the horizontal pressure against the dam-head is equal to 31·25 lb. multiplied by the square of the depth of water, and this for 100 ft. would be 322,500 lb., and this pressure continues to increase as the square of the depth.

And to sustain and resist this pressure a bank must consist of a weight of earth equal to at least double the weight of water, and the fore-bank, or the part in front of the puddle should be of sufficient strength alone to resist the fluid pressure. The water is supposed to be coincident with the top of the embankment, and this strength is necessary, as in case of the contraction of the clay of the puddle there would be a separation of the clay from the earth, and therefore the fore-bank alone would have to sustain the presence of the fluid.

Having cursorily examined this part of the question we will now proceed to view the principle as carried out in practice, and for this purpose will select one of the most successful works of the late Mr. Telford, viz., the Rotten Park Reservoir, belonging to the Birmingham Canal Navigation.

The dam-head is 50 ft. deep (depth of water 45 ft.); width of top bank, 20 ft.; base, 270 ft.; inner slope, 3 to 1; outer slope, 2 to 1; puddle, 15 ft. at base, 6 ft. at top. So, if we apply a rough rule, the width of the top of the embankment is two-fifths of the depth, and with the given slopes making the base about 5½ times more than the depth. If we apply the rule above mentioned to this embankment, multiply 31·25 by the square of the depth, and the horizontal pressure is 63·281 lb., while the weight of the embankment in front of the puddle would be 486,400 lb., and the weight of water resting upon it 196,840 lb., or considerably less than one-half of the weight of the bank.

Now, if we apply this rule to the Bradfield Reservoir, by way of elucidation as we proceed, which was of the following dimensions: depth of bank, 95 ft.; width of top bank, 12 ft.; base, 500 ft.; slopes, 2½ to 1; the weight of the bank to resist pressure was 1,241,600 lb.; weight of water pressing against the fore slopes, calculated as before mentioned, 638,270 lb.; horizontal pressure of water, 282,031 lb.

So the weight of the Bradfield embankment was less than double the pressure of water resting upon it, while the Rotten Park Reservoir was considerably in excess of that quantity; and this, coupled with the loose, porous character of the earth composing the bank, which permitted the water to soak into and penetrate it, by which means the equilibrium was destroyed, and it absolutely failed from sheer inability to support and resist the hydraulic pressure to which it was subject; while, on the other hand, the Rotten Park Reservoir bank was firmly and solidly constructed of good terracious clay, which did not permit any infiltration or soakage of any kind.

The top width of the Bradfield bank should have been 40 ft. wide; base, 540 ft. The same fatality attended the Bilberry Reservoir, which proved itself of insufficient strength. Its dimensions were as follows: bank, 96 ft. deep; width of top bank, 16 ft.; base, 496 ft.; and if we apply the same rules, it would be found that the top width of the bank should have been 38 ft.; the base, 518 ft., instead of the former dimensions. And if these dam-heads had been con-

* See p. 502, *ante*.

structed of the dimensions given, of proper material, and in a substantial and workmanlike manner, the melancholy catastrophe at those places would not have occurred; the public would have been spared the heartrending shock, and the profession the obloquy that inevitably falls upon all, as well as those personally concerned.

It is always good policy in designing and laying out engineering works, particularly when water has to be dealt with, to err on the side of safety: one had better spend a little extra money, and place the strength of the works beyond the possibility of failure, than to calculate, theoretically and experimentally, upon so fine a principle of probabilities, that the slightest additional weight or accident will turn the scale against you. Hughes, in the "Treatise on Water-works," states that at the compensation reservoir at Longdendale, the embankment is 27 ft. wide at top, and, as the water is 90 ft. deep, it is too narrow to support so vast a weight of water, and should have been at least 36 ft. wide. On the other hand, at the Round Wood reservoir, Dublin, laid out by another eminent engineer, the depth of the dam-head is 60 ft., width of top bank 30 ft., and this might have been safely reduced to 24 ft., and is as much in excess of proper width as the other is deficient. Nevertheless, at Round Wood there have been leakage and failures, and these probably arose from some oversight in not thoroughly examining the geological strata of the base of the dam, or the area which is covered by the water of the reservoir, but it has not been exposed to landslips, as was the case at Longdendale, and which occasioned at one time much anxiety and expense, so much so as to require a conference of engineers to elucidate the mystery, and to point out a remedy. If we direct our attention to the various hydraulic works or tables that are published, they afford us very little trustworthy or correct data to govern us in the construction of such works. Molesworth, in his tables, gives the following formula for dam-heads:—

Width at top in high dams, 7 ft. to 20 ft.
Width at top in low dams = the height.
Breast slopes 3 to 1, and 2 to 1.
Height above surface of water, 3 ft. 6 in.

For masonry dams the formula is as follows:—

Width at bottom = height × 0·7
Width at middle = do. × 0·5
Width at top = do. × 0·3

And these arbitrary dimensions are given without reference to the height of the dam, the depth of water, or other trustworthy data.

The "Engineer and Contractor's Pocket-book" gives the vertical pressure of water on the bottom of the reservoir (62·5 by the depth), and the horizontal pressure against the dam (31·25 by square of the depth); and it is further stated that it is usual to make the embankments at top from 15 ft. to 30 ft. wide, the latter dimension would be about the width for a reservoir 60 ft. deep, the inside slopes to be 3 to 1, outside 2 to 1, and the top of the dam to be from 5 ft. to 8 ft. above top water. It further states, usually but not always, a puddle wall is made in the centre of the embankment to within 2 ft. or 3 ft. of the top, which should be from 5 ft. to 8 ft. wide at the top of the puddle, and slope down with a batter of 2½ in. per foot vertical. For dams executed in masonry, the thickness at bottom should be 7-10ths of the height, 5-10ths at mean height, and 3-10ths at top; and although they are very particular in giving the exact proportions in dams of masonry, yet in dams of earthwork no defined theory appears to them applicable, otherwise than a general mathematical one. This information is derived from the "Aide-Mémoire," where it first appeared.

Cresy, in his "Encyclopædia of Engineering," touches very lightly and generally on the subject; and in "Telford's Memorandum-Book" a formula is given for calculating the pressure on the whole side or bank of a reservoir or tank say 18 ft. long and 6 ft. deep.

Thus 2-3rds of 6 (being the centre of pressure) is 4: then 4 × 62·5 = 250 lb., being the mean pressure on each square foot of the plane, and the length 18 × 6 = 108 square feet × again by 250 = 27,000 lb., the pressure against the whole area.

But after giving us the pressure of water against the embankment, he gives us no formula for an earthen embankment to support and resist the pressure; and the divergence of practice, and different opinions of professional men, render the question difficult to comprehend and to thoroughly understand.

Hughes, on Water-works, who gives us some details of water-works construction and the dimensions of a few reservoir works, mentions two or three of this country, but affords but little information on that subject, and such that cannot be of much service to the practical man.

Dwyer, on Hydraulics, affords us no information as to the construction of earthen dams; but at page 177 he gives us a formula to calculate the pressure of water, which is follows: Multiply the sectional area by half the altitude, and by 62½, the product is the pressure in pounds. But without giving us any definite proportions for dams, he observes all gates, sluices, banks, &c., should be strengthened in proportion to their section. The centre of pressure being at one-third the altitude of the dam, to this point the additional support should be applied to enable them to withstand the hydrostatic pressure.

In Beadmore's very useful tables there are no allusions made to either earthen or masonry dams; and although much of what appears there is very good and trustworthy in other respects, still it appears to us incomplete without this necessary information.

Jamieson (or rather, say, Turnbull), in his "Mechanics of Fluids," p. 191, gives formulæ for computing the strength of earthen embankments to reservoirs, in which he goes very much into detail, and it is very complicated and prolix, and would occupy too much of our space for us to transpose it, and we must content ourselves by drawing attention and referring to it.

But although in the above works we find little information to assist the practical man, we find some good sound knowledge in a little work of Weale's Series, by Mr. Wiggins, F.G.S., on "Sea Embankments." He says, "The weight of embankments is of the utmost importance, first, to counterbalance the weight of the sea-water against it, that weight being augmented by the winds, &c., to a considerable extent."

This condition of weight is so important that, in some cases of light material, the safety of the banks depends on it, and a bank must be rendered weighty in proportion, either by enlarging its bulk or by more weighty material, or stone laid on the lighter material. The force of sea-water pressing against a bank will be in the compound ratio of its depth and its velocity. Every attempt to reduce these to calculation will be in some degree nugatory, because one may at times greatly exceed the other; but they often act in combination, and the bank must therefore be superior to their greatest united force.

The weight of sea-water is 64½ lb. per cubic foot, and the weight of earth about 1½ ton per cubic yard, or 125 lb. to the cubic foot. We may, therefore, safely take the weight of the materials usually employed in sea banks to be nearly equal to double the actual weight of the quiescent water they have to sustain, because the resisting power of the dead weight of earthy and stony matter is greatly augmented by its cohesion, and by the weight of water which rests upon the surface, which also tends to its support.

But this difference of weight in favour of earthy matter is not considered in practice sufficient for absolute security, and accordingly it is usual to increase the substance and weight of the bank by additions to its thickness at the apex, so as to raise it to nearly double the utmost weight that can be brought to bear upon it, and to place this additional substance in the strongest form. The same natural laws that govern a sea bank act also to a certain extent on reservoir banks, except that sea-water is slightly heavier than pure water, and the action of the wind much is greater.

In India, where they have carried out some very extensive reservoir works, they have a very simple practical formula which they use for heavy embankments, which is as follows:—Multiply the extreme depth of the dam-head by five, and that added to the width of the top bank gives the base. For instance, if an embankment were 85 ft. deep, that multiplied by 5 = 425 ft. + 30 ft., width of top bank, equal to 455 ft. base. The front slopes 1 to 1 or 1 to 1½, and 2 or 3 to 1 in the rear. The earth that usually composed it was clayey and generally adhesive earth. In this case there is an arbitrary width of top given, but that we have endeavoured to show should be regulated by the depth of the reservoir and the weight and pressure of water upon the bank, and the slopes we think should be reversed.

Workmanship.—But let a reservoir be ever so skilfully and well designed and laid out, and the site however carefully selected, it amounts to very little, and is almost labour in vain, if the works are not properly executed and put together, of good and suitable materials and workmanship, and the whole substantially constructed and formed.

The seat of the dam-head is also an important subject for consideration. It should not be laid on sloping ground, but formed on level places or benchings, and connected with water-tight strata; in the same way up the sloping sides of a valley, it should be benched in and well connected with the substrata after the whole of the soil has been stripped off. In forming and raising the banks it should be laid on in lifts or courses of not less than 1 ft., or exceeding 3 ft. in thickness, over the whole width of the base of the embankment, inclining a little from the outer side towards the puddle-wall or centre, and each layer should be properly spread and thoroughly consolidated either by means of punning or by carting over it with three-wheeled carts, or other means. Embankments either formed of barrows or tramways are always liable to be loose, porous, and unconsolidated, and require the utmost attention in laying the earth on, or mechanical means must be adopted to render it solid and compact, as also time allowed for the earthwork to find a solid basis from its own insistent weight and gravity. No large stones should be used in the structure of the banks, and large lumps of earth, clay, &c., should be broken up, so that every part may become firm and compact.

No deep or heavy embankment ought to be completed at once; it ought to be formed and raised in a series of stages, and be left a time exposed to the action of the weather, for a winter at least, as embankments hurriedly and loosely put together sink more or less for several years after construction, of which we have full evidence in the large number of railway and canal embankments that have sunk and required raising, during the canal and railway era, and from which cause many serious accidents have occurred.

As a case in point we may mention a serious accident that recently took place on a Cambrian railway, by which means a locomotive engine and train of carriages were precipitated into a river, attended with loss of life; and this was occasioned by a loose and unconsolidated embankment, one that had recently been constructed and put hurriedly and loosely together, as is too generally the case in such works. The streams where the accident occurred are in that district where the Severn takes its rise, and had been recently very much swollen from heavy rains, and this was improperly dammed up by a railway bridge of insufficient water-way to take the accumulated water; the consequence was, the mass of water rising against the embankment soaked into and penetrated it so much, that with its great body and weight it upset and made a breach in it to effect a passage, and by this means the flood was reduced.

As this district was well known to be subject to floods, care should have been taken to have put in a bridge of sufficient capacity in the waterway, and the embankment ought to have been constructed in such a manner as to resist the weight and pressure of the accumulated waters,—in fact, as carefully and substantially as a well-constructed reservoir embankment ought to be.

Where railway embankments are exposed to the action of water precisely the same system is required in construction, consolidation, and protection (except the puddle), as a reservoir embankment; and when the constructors fail to carry out that principle, then we shall be likely to hear of serious catastrophes similar to that which took place on the Cambrian Railway.

The puddle wall, composed of well-tempered clay and other ingredients, is also another indispensable adjunct to reservoir works; but upon the strength of this there is some difference of opinion. Telford, Walker, and other old, and most of our present hydraulic engineers, prefer using it in the centre of the embankment, but in many of the modern works they are not made of that thickness, strength, and consistency as were formerly adopted. Telford's puddle wall at the Rotten Park Reservoir for a 50-ft. bank was 15 ft. thick at the base, tapering up to 6 ft. at the top; while the Bradfield Reservoir puddle wall was 4 ft. thick at the top, increasing 1½ in. in thickness for every foot of depth, making the thickness

of the puddle 15 ft. 10 in. at the base for an embankment 95 ft. deep: this, like the bank itself, was considerably too thin and weak, which was proved to the satisfaction of every unprejudiced observer.

The puddle of the Bilberry Reservoir was also 16 ft. thick at the base only, tapering to 8 ft. at the top, with a depth of bank equal to 96 ft.; and this also proved its inherent weakness, and is another striking instance of defective work.

It is also of the first importance that the puddle wall should be thoroughly connected with a water-tight stratum under the seat of the bank: in the instance of Bradfield it is said the engineer sank to a depth of 60 ft. below the seat of the bank to secure that object, but they appeared to be so much troubled with springs, requiring a powerful steam-engine to keep down the water, that it is probable no good and efficient connection was formed with the water-tight strata.

There is also a difference of opinion amongst engineers as to the best and most proper method of constructing reservoir embankments. Some advocate the construction of them without the central wall of puddled clay, and their plan is to carry up the bank in lifts or layers of retentive clay or alluvial earth, carefully put together. On the other hand, and on the contrary, many still consider the puddle-wall an essential element in their perfect and water-tight construction.

Mr. Thom, of Glasgow, appears to have been one of the first to adopt the former practice; and this, we believe, is much adopted in the North, and may be termed, *par excellence*, the Scottish system.

The method of executing the works is as follows: — The embankments are constructed usually with slopes of 3 to 1, and the ground is excavated for the seat of the bank until they reach a firm and water-tight stratum, and upon this is formed the bank, spread in alternate layers of puddled peat or alluvial earth; and generally these layers are mixed and beaten well with wooden dumpers until they are thoroughly consolidated and firmly united together. The inner slopes are then covered with puddle, made of tempered clay mixed with small gravel or furnace cinders, so as to prevent the possibility of rats or other vermin from penetrating into the embankment, and thus causing it to leak.

In contradistinction, and by way of comparison, we may mention one made on the principle of the old canal engineers, and by a worthy lieutenant of Telford; and although it is of a somewhat lighter system of construction than previously laid down in this paper, yet the work was so carefully executed, and of such sound and durable materials, that it has stood remarkably well, and is an enduring monument of engineering skill.

The reservoir we allude to is situated at Harleston, Cheshire, and belongs to the Ellesmere and Chester system of canals. The embankment is of the following dimensions: 40 ft. deep, 10 ft. wide at top, and 210 ft. at the base; inner slope, 3 to 1; outer slope, 2 to 1. Puddle-wall, 10 ft. thick at base, tapering to 4 ft. at the top. The inner slope of this bank was lined 4 ft. thick of clay, laid on in courses 12 in. thick. The lumps of clay were carefully chopped small, and afterwards soundly punned, so as to form a compact and water-tight covering.

The embankment itself was chiefly composed of clay (the celebrated Cheshire clay—not the most trustworthy material), laid on in regular lifts or layers, of not more than 4 ft. 6 in. in thickness, and these lifts were continued all over the length and breadth of the embankment, and each lift was completed before another was commenced.

All large lumps of clay or other earth were carefully chopped and broken, and afterwards thoroughly punned and made as solid as possible, which was a work of considerable labour and expense; but it was attended with marked advantage, as it formed a perfectly solid bank, requiring little or no repair since its construction, which took place in the year 1830.

Although this embankment, like many more of the reservoir works attached to our canal system, has been attended with signal success, notwithstanding the thickness of the lifts, we think the lifts of greater thickness than desirable to form compact and solid banks, or for the deep embankments of the reservoirs of our modern waterworks; we consider lifts of 2 ft. or 3 ft. in thickness ample for the purpose, to ensure sound, water-tight, and durable work: indeed, the lifts cannot be too thin, if we are to consider only the thorough consolidation of the bank; but as less than the depth above mentioned would be attended with inconvenience in conducting the work, and considerable additional expense, it would add materially and unnecessarily, we think, to the otherwise very costly character of modern water-works.

We dare say it will be remembered that on the occasion of the serious calamity that occurred at Bradfield, near Sheffield, exception was taken not only to the design of the new Sheffield Reservoir embankments, but also to the manner of constructing them. The lifts, or layers, were from 6 ft. to 9 ft. in thickness, and the whole earthwork was being constructed and put together as loosely and carelessly as it was possible to do it, tipped from tram wagons, and brought into the bank with tramways,—in fact, similar to the modern system of making railway embankments.

And that system even for railways is very faulty and open to grave objection, as is well known to railway engineers and contractors, and also to directors; for railway embankments hurriedly and carelessly put together continue settling and sinking some years after construction, and are often the cause of serious and calamitous accidents, with their attendant costly consequences to the shareholders. But in reservoir works, such loosely-constructed and hurried works are exceedingly risky, and doubly disastrous, as water in its action, contrary to the rolling stock of railways, presses every way, inciduously permeates, and will certainly find a vent or weak place, if any exist; and if a failure take place, its consequences are not confined to its immediate locality, as with a railway, but, like the Bradfield devastation, sweeps everything before it for miles, the impetuous and overwhelming torrent topples over houses and bridges, roots up immense trees, and carries onward in its headlong career a hecatomb of precious lives, with all their imperfections on their heads, to eternity.

SURREY ARCHÆOLOGICAL SOCIETY.

The annual excursion of the members of this Archæological Society has taken place. Dorking was the rendezvous for starting. About 170 members and friends assembled to celebrate the society's popular "outing." The first place selected for a visit was Milton Court. The building is in the Elizabethan style of architecture, and the chief item of attraction is the grand staircase. Mr. Charles explained the points of interest connected with the building. On leaving Milton the company were next conducted to Wootton Church, where the duty of describing the various points of interest was undertaken by the Rev. E. Evelyn, the Rector, in the absence of Mr. Bailey, who was prevented from reading a paper on the subject. Upon leaving the church the Rev. Mr. Evelyn kindly invited the company to partake of luncheon at the rectory.

"Oakwood Chapel" was the next place mentioned in the programme, but to go there, owing to the distance, was found impracticable, and the excursionists next enjoyed a delightful drive through a magnificently wooded country to Anstiebury Camp, near Leith Hill. Mr. W. Pocock "did the descriptive." The company next took conveyance back to Dorking to visit the museum at Pippbrook House, the residence of Major Burt. Leaving Pippbrook House, the party visited the new chancel in Dorking Church, and wended their way to Sondes Place Farm, where they were entertained at the expense of Mr. George Cubitt, M.P. Unfortunately, a prior engagement in Ireland prevented Mr. Cubitt being present.

About twenty new members were proposed and declared elected.

Antiquities of Abyssinia.— The German traveller Rohlfs has arrived at Bremen on his return from Abyssinia, where he filled the office of interpreter to the English expeditionary corps. After the taking of Magdala he went alone to Lallibala, the holy city of the country, which has not been visited by any European for more than three centuries (?). He found there nine Christian churches of the primitive Byzantine style of architecture, all monoliths, that is to say, each hollowed out of one enormous block of stone, and richly ornamented. In afterwards passing by Axum he discovered that the last of the obelisks still standing in that place is in a state of almost complete ruin.

ON FOREIGN ARTISTS EMPLOYED IN ENGLAND DURING THE SIXTEENTH CENTURY, AND THEIR INFLUENCE ON BRITISH ART.

The paper on this subject, read by Mr. Digby Wyatt, at the Institute of Architects, and printed, for the most part in our columns,* gave rise to a discussion at another meeting of the Institute, which was carried on with ability and useful results. We confine ourselves in noticing it to the observations of three or four of the speakers who touched principles.

Mr. E. C. Robins read the following remarks on the paper: — It is with great diffidence that I venture to express very hastily the thoughts to which my perusal of Mr. Wyatt's paper has given rise. There is something especially refreshing and invigorating in the unhesitating adhesion of such a man as Mr. Wyatt to principles not now particularly popular. One is carried back to the days of one's pupilage, when the absolute divinity of Grecian architecture was a leading article of professional faith, and the Roman art of the Augustan age its only rival for supremacy. Mr. Wyatt boldly appears, not as the apologist, but as the champion of the much-abused Renaissance style of art, and the recorder of the histories of those men to whom he says we owe "the rapid formation of the great English School of Architects, to whom we are indebted for the creation of the so-called Elizabethan, and who kept alive the flame of that lamp of symmetry and comeliness of structure which ultimately, through Jones and Wren, shed its rays far and wide, not through England only, but to every land and clime in which such noble and right royal architecture as theirs will and must be cherished as long as arts may flourish and mankind endure." The foreign source of the stream of art thus overflowing this country is indicated in the title of the paper; still Mr. Wyatt is at some pains to show the national character of this new development of the arts here. He gives it as his opinion that English Gothic art was in its decrepitude, that Renaissance was in its prime, and that the result of their association was "the birth of an entirely new phase of art," culminating in the triumphant ascendancy of foreign ideas, and the revival and permanent establishment of classicality. The philosophical remarks at the opening of the paper and dispersed throughout it do not appear to be the logical consequence of reasoning upon the facts, but rather the statement of the premises of an argument attempted to be supported by facts, but which the facts collected fail to sustain, and in many cases seem to contradict. Thus, English Gothic art is stated to be in its decrepitude at a time when Beauchamp Chapel, Eton College Chapel, St. George's Chapel, Windsor, Bath Abbey, Henry VII.'s Chapel, and King's College, Cambridge, were the embodiments of the "technic, æsthetic, and phonetic" condition of the arts of this country; buildings which Mr. Wyatt acknowledges "were of remarkable merit in technical execution, as well as in grace and beauty of design," and he does not point to any subsequent works of equal extent at all comparable with them. The Wars of the Roses sufficiently account for the decline in some of the industrial arts, in sculpture, painting, and jewelry; but they do not seem to have retarded the conception and execution of the great works before mentioned; and the decrepitude of English Gothic art would not seem to have existed until premature old age resulted from the neglect of it by Church and State. And who was accountable for this but Henry VIII. himself, who introduced foreign elements of design against the will of his people, which led to the popular rising described by Mr. Wyatt, which was put down by brute force only, but which still found vent in the ballads of the time? This prince, instead of nourishing native art, patronized foreigners of all descriptions, and the native art force, having reached such a culminating point of excellence as evidenced by the buildings referred to—which, admitting all their faults, have nothing like them in the world—was crushed out of it by disappointment and discredit, and want of encouragement from either churchmen or statesmen. And from that time to the present foreign fashions have been preferred to native worth.

"With the development of the principles of the Reformation, men naturally refused to put

* See pp. 423 and 443, *ante*.

new wine into old bottles," says Mr. Wyatt; "and the country, beginning with Royalty, and proceeding through the chief nobles and successive Ministers of State, ripened for that inoculation of novelty from abroad which, as we shall have occasion to see, rapidly supplanted the old systems of progress by spontaneous internal national combustion."

What! is it a thing for which we have any reason to be congratulated that the "inoculation of novelty from abroad should supplant the old systems of progress?" Does Mr. Wyatt doubt that those principles were sound and true? Was not the distinctive character of the arts as they existed in this country at the period, its national glory, as the exponent of its individuality and the outcome of the religious aspirations of its people? Did it not possess the charm of native beauty, in common with other distinct styles of art, the intrinsic worth of which are just in the same proportion that they were the expression of the necessities of the originators, their earnest craving to worthily represent their ideal of beauty or magnificence, their desire to exhibit their fear of the gods, honour to the king, and respect to themselves? Is it not illogical to assert that such inoculation by force from without was the result of "spontaneous internal national combustion?" Surely it was not the love of the profane arts introduced by foreigners that made them flourish; they never were popular till generations of apathy had passed; it was owing to the patronage of the influential few—the King and his Court. Was not the Elizabethan style provoked by the lingering love of the people for its own forms of art and its determination to engraft upon the foreign taste all of English feeling that it could?—a final protest against the imputation of decrepitude. The *life* of art was not in the importations from abroad; what of life remained was indigenous to the soil. The absurd incongruities of Nonsuch Palace found no popular sympathy, any more than the Brighton Pavilion. And once let loose by the wiser policy and purer taste of the Cardinal, the native arts revelled in the pleasantries of Hampton Court, of which old Skelton sings:—

> "The Kynge's Court
> Should have the excellence;
> But Hampton Court
> Hath the pre-emynence."

English art died no natural death, was suffered to reach no decrepitude, but was tortured and finally strangled by that same egotistical prince whom Mr. Wyatt delights to honour—who sacrificed so many other "graces" to his lust. But Mr. Wyatt does not seem to see the caustic wit that suggested the placing of the "hoole personage" of Henry VIII. on the curling locks of the capital of an Ionic column. Again, is it fair to the spirit of the reformed religion to say that the new wine was put into new bottles because the old were not trustworthy, when in fact it was enshrined in those very forms of art dedicated to the special service of the still unreformed religion? Rather, was it not indicative of the incongruities of the age, whereby the suppression of bigotry was made the business of an impure prince? Yet Mr. Wyatt would ratify the spurious title of "Defender of the Faith," and add the equally well-deserved title of "Regenerator of the Arts." Whatever the genius of the foreign artists, however great their technical skill in the details of the arts of sculpture and painting and industries of the period, there was no heart, no love, no noble ideal. The old Church had corrupted itself and was despised; the new was made despicable by its supporters, was wounded in the house of its friends; and the result was that no religious aspirations inspired the age, either here or abroad, and forms of art naturally partook of the learning of the schools, "Renascence" intellectualism, as Mr. Matthew Arnold writes it,—and heathen mythology was the accepted storehouse of symbolism; a state of things well reflected in the pages of Ruskin, who says in his fourth Edinburgh Lecture:—

"The world has had a trinity of ages,—the classical age, extending to the fall of the Roman empire; the mediæval age, extending to the close of the fifteenth century; the modern age, thenceforward to our own times; a change taking place about the time of Raffaelle in the spirit of Roman Catholics and Protestants both, a change which consisted in the denial of their religious belief as heretofore expressed in the outward things of life. Thus, before the revival of classic art the very furniture of the king's house was made to confess his Christianity: it may be imperfect and impure Christianity, but, such as it might be, it was all that men had then to live and die by; and there was not a pane of glass in their windows nor a pallet by their bedside that did not profess and proclaim it. Since that period the decoration has consisted of Cupids and Graces, Floras, Dianas, Jupiters, Junos, &c., as if we were born heathens; so that the great broad fact which distinguishes modern art from mediæval is this,—that all ancient art was religious, and all modern art profane."

"Freedom and hope," says Fergusson, in his "True Principles of Beauty in Art," "are the first two principles of greatness in art as in everything else; and servility and despair of doing better than has been done before must cramp the noblest genius and hide the highest aim."

It has been well said that if there is one word by which an artist or critic may be tested,—a single term in which all truth in art and all virtue in action might be summed up, in which we could find all the essence of a mind or the purpose of a life,—it should be the term Ideal. The reception of this term in all its consequences, or, on the other hand, its utter rejection, at once determines what an artist is in his ends and aims. To have *no ideal* is to have nothing to strive for or hope after. The ideal should be the end and aim of the fine arts, as distinct from engineering. It was Coleridge who said that a "picture was an intermediate something between a thought and a thing." The thought and the thing stand respectively for the outward world of matter and the inner world of mind. The thing or object is received and taken from visible nature into the inner mind of the artist, and there, being elaborated and combined with his individual idiosyncrasy of thought and feeling, comes forth a second time into actual existence under the new and created form of art. The primary, the raw material is nature; the forming, however, is mind; and the ultimate product, art. Nature enters into the mind a fact, a reality, and issues forth a picture, a poem, an ideality. To the nature around him the artist adds his own nature.

> "And thus it is that native air
> Mind informs with visions fair."
> "Within the pale
> We stand, and in that form and face behold
> What mind can make where Nature's self would fail."

In an estimate of the conditions under which the "creation of an entirely new phase of art" is possible, why does Mr. Wyatt ignore the effect of the absence of any noble ideal in the influence of foreign artists on British art? All true development is from within and thence without, inward enlightenment expressing itself in outward form; and all true and noble art is an outward and visible sign of an inward and spiritual gift or grace. Take the life of Torregiano, "the first great Italian master upon whom the king most fortunately alighted," says Mr. Wyatt, and consider for a moment what great development of art in its highest range may be expected from the mental laboratory of one who begins life by breaking the nose of Michelangelo (whom he always hated, says Vasari, because he was superior to himself), who was afterwards employed by Pope Alexander at the Vatican, but whom he speedily left for the army because the pay and spoil attracted him. Disappointed of the promotion he coveted, he returned to his art, which for itself he had no love, and worked in bronze and in marble such things as his sordid mind could conceive and his facile fingers embody. It needed little purity of soul to please the voluptuous Harry: so he was invited to England, lured by the better pay; but here this ill-conditioned man, the pioneer of the mercenary artists who followed him for the same good pay, was soon obliged to leave for Spain, where he got into trouble for smashing a figure of the Virgin, for whose purity he can have had no reverence, no heart to portray; and art can have consequently suffered little loss by the demolition. Yet it is to such a man and to such men that the students of the nineteenth century are bidden as to a festival of good things. But I believe it to be as true to-day as twenty years ago when Fergusson uttered it:—

"One of the most fundamental rules of art is that sordid minds cannot express elevation, the impure cannot express purity, or the vulgar mind elegance: if we want lofty, pure, and elegant art we must go to minds where those feelings exist; for all arts are the reflex of the individual or the nation practising them, and the improvement must come from within, either from more sedulous cultivation of purity and the higher emotions, or by a more honest and straightforward mode of expression than has hitherto been adopted. On the other hand, we may feel perfectly certain that all that is bad in the individual or the nation will come out in their art, however much they may attempt to disguise it by foreign costumes or plumes borrowed from those who were artists not only in form but in spirit. Art must come from the heart, and can only come from thence."

We do not want artists to give us a picture of what nature *is* only (*that* Torregiano and others like him may do), but what they *think* of nature (and who cares for the thoughts of such a man as he?). The mere copying of nature is not the ultimate end of art. Man has to infuse something of himself into the picture or building. It is the artist or me; acting on the Not me. We do not want a dwarfed and caricatured naturalism, but an inspired literalism. What seems most required to effect a revivification of the arts at any period of their decline is inspiration, besides that which may be learnt at schools; and this is often the fruit of honest labour and of pure thought.*

I hope I have made clear the points on which I am chiefly disappointed in Mr. Wyatt's otherwise remarkable paper, which opens a new page in the history of art. At the same time let me say that I greatly sympathise with Mr. Wyatt's cosmopolitanism, and would desire to steer clear, as he has done, of the error of those whose preconceived preference for some particular style or phase of art, blinds them to the beauty of others; but I should wish to avoid latitudinarianism. To more accurately define my meaning, I cannot do better than quote, in conclusion, the following contrast between Grecian and Gothic art, sent to me in a letter from my friend the Rev. G. B. Porteous, who thus sums up their powers and limitations:—

"In sculpture one sees nothing so fine as the Greek remains. It is a shame that the idolator should have stood nearer to nature and have wrestled more triumphantly with her veiled angel than the sculptors of any Christian age. The only Christian sculpture of profound merit is to be found in the general style and execution of the cathedral. Here, indeed, is something which, in uniting beauty and perfection, stands far above the graceful temple of the Greek or the more massive structure of the Egyptian, and is calculated by its general effect to lead the soul into states where the imprisoned loveliness within the soul itself can burst its fetters and execute the behest of the Divine Original. In classical civilization among the Greeks we had finer architecture than has ever been seen since. The sons of Hellas, a national incarnation of intellect, the grand *acatar* of genius, the light-bringers of the world, were real architects; as real as unreligious men could be. Let their archaic sculpture give the first response; and next, is not their architecture clear, finished, and faultless? Is not the symbolic character of Greek architecture a reflection of well-defined ideas, though of miserably dormant affections? Is not the very completeness of Grecian architecture symbolical of a mind habituated to ideas well formed, which it effectually grasps, while yet ignorant of those aspirations which ascend heavenward to the unlimited vastitudes of the infinite and the eternal, of which a Gothic cathedral is so befitting and so magnificent an expression? The Parthenon is thought manifested in marble; York Minster is faith reflected in stone. One is the product of intellect; the other is the offspring of the moral sentiments. The first is an idea; the last is a prayer. Artists designed the former, but saints must have conceived the latter."

Professor Donaldson.—If I understand Mr. Digby Wyatt's paper aright, and the intention with which he has written it, I should say that it was not to justify the introduction of a new style of art, nor to condemn the old one, which really seemed to have exhausted itself; but merely to follow out and to give us the history of the artistic training of the mind, which eventually produced the invention or adoption of a new style of art altogether. I think Mr. Wyatt was quite justified in saying that Gothic art at that time was in a state of decadence, because, if we only look at the exterior of Henry VII.'s Chapel, we must own that there was then great degradation of taste; and there is no one who has studied Gothic or Mediæval art but must acknowledge that, at that time, it was not worthy of continuing its career. There is a difference when we consider the vaulting of the chapel itself, because that was rather the scientific work of the mason than the artistic combination of the architect. The structural skill with which the vaulting is arranged is such as to surpass almost any previous combination of a like nature; and, in point of art, there is exquisite beauty. But the exterior of Henry VII.'s Chapel altogether certainly shows that art had arrived at a very low ebb in point of taste. We are much indebted to Mr. Wyatt for going through the analytical study of the development of the new style of art in this country, following it through all its phases, and pointing out to whom we may attribute the introduction of

* The recognition, appreciation, and interpenetration of the "true styles." Surely it is the union of strength and beauty, not the association of decrepitude and pedantry to which we should look for the "birth of an entirely new phase of art."

this new style, and the various steps by which we arrived at its transition in the sixteenth century. Now, we must recollect what had led to this. The whole of the Continent had been in commotion for a century previously, not merely politically, but in a certain artistic and literary sense, in consequence of the Greeks having been driven out of Constantinople and having taken refuge in Italy. The study of classic literature was revived through them, and began to resume its great dimensions and proportions, for it had been altogether lost. When it was reverted to again, it naturally induced the study of architecture and of sculpture of the Classic period, and of pictorial representations, few only, however, of which then remained, as in the Baths of Titus; and it was this that led the Italian mind into a new train of ideas, weary with the incongruous buildings of the pseudo-Gothic stamp in that country. These were most barbaric productions—mixtures of all kinds of sentiment borrowed from the North, and from Germany especially; the incongruous remnants of old buildings, put together as chance might direct, and without any rule of art; producing masses of buildings of a certain imposing size, with occasional graceful chance-combinations, but, as works of art, incomplete;—I say, dissatisfied with this state of things, the Italians wanted to have some fixed laws of art which should do away with these incongruities and these jarring principles of design, which should elevate art upon the same principles as classic literature, based on coherent forms and well-understood principles. Such was the case upon the Continent, the Italian mind being then very vigorous and powerful; in fact, I may say the Italians at that period were the first nation in the world,—in Europe certainly. They were brilliant in their imagination, eloquent with all the burning emphasis of a most impassioned language; they were enthusiastic in all they undertook, regardless of personal consequences; imbued with a deep love of the arts, pictorial and musical; they were inspired, for they had a natural rich store of invention and originality of ideas, not without deep and erudite investigation of the secrets of nature and the more obvious beauties of the animal and vegetable world; devoting their lives to the pursuits they followed. Such were the people who took the lead throughout all Europe, and, therefore, all Europe naturally followed them. The other European peoples were not endowed to the same extent with the same qualities; they were not possessed of the like rare faculties, and, therefore, feeling the influence of such superior minds, they instinctively yielded to their impulse. Now, England could not stand alone: she must be actuated by like feelings; and, naturally enough, she followed in the wake. We know the intimate relations which existed between Francis I. and Henry VIII., and the influence which the French king had in those days upon ours, and of which the interview on the Field of Gold between the two monarchs at Calais is a proof. It appears to me, therefore, that it was impossible—altogether impossible—for England to remain behind the nations of the Continent, retaining its Mediæval propensities and preferences; but it was obliged to adopt the new taste prevalent throughout Europe. Now it is the investigation of that, and of the process of the teaching of the English mind for the introduction of that new class of art which Mr. Digby Wyatt has sought to bring before us. We know that in our universities Erasmus, Bucer, and other intelligent foreigners were induced to come here to teach the classic languages and the philosophy of the Continent. In like manner, for the promotion of art Holbein was brought over with the able artists who have been mentioned by Mr. Wyatt in his paper, and whose various works have been described to us with so much discrimination as to their relative merits. I think, therefore, that it is extremely instructive to us that our friend should have pursued the subject so far, and should have investigated what was hitherto to a certain degree quite a mystery and an unknown subject, I believe, to nearly all of us—at least, I myself was not aware of the minute history of the art of that period. We knew that Holbein came over here and influenced the arts of this country; and in regard to architecture, we have an instance near us, at Hampton Court, of the graceful architecture he had introduced. We knew he erected a gateway at Whitehall; but how these and other pictorial influences came to bear upon architecture we could hardly see or understand. Now, I was alluding to the power of the Italian mind; and our attention has been drawn by Mr. Wyatt to the circumstance that Leonardo da Vinci, Holbein, and Albert Durer had impressed upon the men of the period the necessity of the study of mathematics and of the mastery of drawing the human figure. These were the two grand elements upon which all art should be founded, and they were themselves very eminent in possessing these great acquirements. There was this misfortune, however, that painters did not satisfy themselves with being painters; sculptors were not content with being sculptors; nor were architects always satisfied with being architects alone; but they mixed up and practised other arts, as we know by the productions of the various artists alluded to by Mr. Wyatt in his paper. That was a misfortune. I think that architecture particularly has suffered by the innovations introduced by painters and sculptors; and in this respect it seems to me no greater injury was ever done to our art than by Michelangelo himself and by Bernini. They destroyed the purity of taste, introducing capricious varieties and all sorts of distortions and contortions in architecture, by which it was degraded materially. It is only men like Alberti, Vignola, Palladio, and others, purely architects, who have vindicated architecture as an art independently of all others. We can perceive, with respect to our buildings of the early period of the reformation of art, that they were very much influenced by not being undertaken by architects alone, but by painters. We see at Fontainebleau that the Italians, who came there not as architects but as painters, introduced every caprice they could think of, and produced a great medley; and although some good picturesque groupings were realized, to say that it is good architecture is not the fact.

Now, I hope Mr. Wyatt will pardon me if I attempt to follow out the architecture of that period, in illustration of our subject, by one particular instance, and that is in a building at Liveden, Northamptonshire, of which there is a plan and perspective view on the wall, taken by myself years ago. I will read an extract from a letter from Mr. Selby, a gentleman who lives in the neighbourhood,—that is, at Pilton, near Oundle, in Northamptonshire, and is well acquainted with the traditionary history of that building.

"The building was erected, or perhaps I should say commenced, by Sir Thomas Tresham, who was knighted by Queen Elizabeth at Kenilworth Castle in his eighteenth year. This gentleman, who appears to have travelled in Italy, and to have been an architect of very great taste, built several other houses, &c., in the county of Northampton, viz., the Hall at Rushton, and a triangular entrance lodge, a beautiful work (both these are near to Rothwell). The house now belongs to Clarke Thornhill, esq. He also placed a rich screen in the church of Geddington. Another specimen of his skill, the Market-house in the old town just spoken of (Rothwell), is still remaining but shamefully neglected. There is a print of this in Baker's 'County History.' It was commenced in 1577, and appears to have been taken down and rebuilt in an open space near the church. It is two stories high, and to each story there is an order, the lower one being Doric with an inscription in the frieze, and the upper one Ionic with panels containing coats of arms on shields. There are semicircular openings below, and above are the usual Elizabethan windows with mullions and transoms at mid height. It was preserved from absolute destruction by purchase from the surplus of a fund raised in 1827 by a few individuals." (*Baker.*)
"Liveden itself," Mr. Selby continues to say, "was most likely never finished with a roof, although the naked floors were laid and continued in the building, then going to ruin, until the Parliamentary wars, when they were cut out by Major Butler, who had the command of some troops on that side, and conveyed to Oundle and re-used, as stated by Bridges in his history of the county."

Now this Liveden, gentlemen, as you see, is in the form of a Greek cross, and it has central pavilions at the end of the arms. There is a kind of podium base, and the sur-base is quite a Gothic moulding. The die of the podium consists of a range of panels with shields in them, and occasional apertures for windows; then above that rises a Doric order, not of columns but of plain walls, but there is a frieze and cornice with triglyphs constituting the first order: then above that is, I suppose, an Ionic cornice, the frieze of which bears an inscription, some of the letters of which still remain and may be seen upon the view exhibited on the wall. The detail of the podium is also shown in a small sketch which I took at the time I visited it. Now my informant goes on to say:—

"Old Liveden was another fine mansion of the family of Tresham, and stood about one-third of a mile from what is called locally the 'new build.' There were two very handsome gateways to the old house. One was long since removed (destroyed) and the other was removed about ten years since and re-erected at Farmingwood's Hall (Lord Lyfden's seat). There is a fair copper-plate engraving of the 'old build,' as it is called, in a work styled 'The Antiquarian Itinerary,' published from 1815 to 1818, in the seventh volume. It is there spoken of under the title of 'leaden old Beel,' which with the whole of the letter-press descriptions of it is a tissue of error. There is no account of the Livedens in Baker's 'County History,' as all this side of the county unfortunately escaped his attention, whilst his power and means remained."

So far Mr. Selby.

I wish to call your attention to this as a beautiful instance of the Renaissance, quite equal to anything to be found in France and Italy. If we had some artists, or if the Government would take up the work, as is done in France, and send competent draughtsmen through the country, and instead of making a collection of higgledy-piggledy bric-a-brac things, like many authors put together in their books; if the pure only were to be chosen, then we should find that this country produced fine works of art, and that that period was one which might be imitated in its spirit with great success at the present time. It is very desirable for us that art should be vindicated from the great trash, which has been published as indicative of that period. My own idea is this, that as we had then but few competent architects and artists, the builders or masons who were employed made designs, which they had not the capacity properly to conceive; they made buildings of a certain size with particular feelings and sentiments of Renaissance, but they were carried out without true taste; and it is under the obloquy of these buildings that we now suffer as to the reputation of that style. I would also call attention in that period to the sepulchral monuments, such quantities of which exist even in the churches of the metropolis. There are some beautiful compositions of this kind in Westminster Abbey, and also in the church of St. Saviour, Southwark, and Ashbourne, in Staffordshire; but throughout the whole country you will find monuments in the churches of exquisite design, great simplicity of taste, and beauty of invention. Immense sums of money were expended upon them, both in regard to the materials of which they were composed, the alabaster and various marbles that were employed, and to the workmanship. Certainly they are very fine productions, and ought not to be allowed to pass away, nor to be so unknown generally as they are at present.

Professor Kerr.—I think we have scarcely recognised as we ought to do the remarks of Mr. Robins, which seem to me to afford a very good illustration of a bad kind of criticism, very common now-a-days. An accomplished gentleman, like Mr. Digby Wyatt, comes before us and reads a communication, which, like himself, is brimful of knowledge; and another gentleman takes leave to criticise it in what is, I hope I may say, without being at all offensive, the least elevated style of criticism that can be adopted in such circumstances. The first question submitted to us by Mr. Robins was whether Mr. Digby Wyatt had not said something disrespectful of Gothic architecture. This is the invariable opening cry raised by a certain sort of persons now-a-days whenever any subject of high-class critical bearing is mooted. Having thus begun, Mr. Robins next proceeded to deal with the critical question on its merits, and again he adopted the ordinary manner of the moment—that is to say, he took the fashionable sentimental view of the question. I may be permitted to say that I am certainly surprised to find a gentleman of Mr. Robins's practical and sensible position in the profession quoting such a writer as Mr. Ruskin against the arguments of Mr. Wyatt. What we have had so often laid before us we have had repeated once more to-night—that in the Middle Ages architecture flourished in consequence of the enthusiastic sentimentality in the people at large. I, for one, never could see anything but the greatest absurdity in such an idea. I believe that the merits of Gothic architecture, often great and often small, were in those old times altogether unconnected with such sentimentality in any shape. There may have been something of the kind amongst some of the clergy, and there may have been an enthusiastic religious feeling, more or less general, amongst some of the laity, according to occasional circumstances; but as for there being anything like a continuous romanticism in the heart of the people at large, of such a kind and of such intensity as to exhibit itself in the details of architectural design, I can only say that I think there cannot by any possibility be a greater fallacy propounded, or anything more subversive of the true principles of artistic criticism. I am anxious that Mr. Robins should not think that I am opposing him too severely, but it is seldom that we have this particular argument of his laid before us in a way so favourable for its refutation. Having, then, fallaciously appealed to our sense of re-

spect for Gothic architecture through our supposed veneration for the imaginary sentimentalism of the Middle Ages, Mr. Robins next proceeded to exhibit another kind of error, which is too prevalent at the present time. He introduced as the great cause of architectural change an individual ruler in the State. Now, no such individual ruler has ever in the history of architecture, as a matter of fact, exercised any such influence in a practical way. In the present instance he assumes that King Henry VIII. was the individual cause of a certain change of architectural style; and then, to prove the character of that change, he holds up to us the character of the king in his private capacity! King Henry VIII. married six wives; but if, instead of six, the number had been sixty, such a circumstance can have had no influence upon architecture. On the contrary, if this king exercised any influence at all upon art, it would be in the capacity of one who was a most accomplished and learned man. Indeed, in this view of the case he was a man who did a great deal for this country, a man whose true position in the intellectual progress of England, as apart from his errors of private life, is now beginning to be more rationally recognised. Certainly, as regards literature and the arts, he was one of the most accomplished men in Europe; and as such we may no doubt believe that he took a certain amount of interest in what was then the object of accomplishment and learning—namely, the spread of the new school of intellect, which took its rise in Italy as the cradle of the modern world. Mr. Digby Wyatt and Professor Donaldson have taken much higher ground than Mr. Robins. They come before us to illustrate a very important period of architectural history in this country, and they do it by means of the resources of learning, by the elaborate collection of facts, and by the deduction of sensible conclusions.

Mr. Wyatt, in replying ultimately, said although Mr. Robins has been ably dealt with by Professor Kerr, I yet feel that a few words are requisite from me, as the author of the paper inculpated. In the first place, it is to be clearly understood that because I may commend one style, and point out certain particular excellencies in it, I am not an advocate of one set of principles only, or that I recognize truth, justice, and excellence in one form only either of "faith" or "works." It is in the nature of the estimate of cosmopolitan principles that a true artist should be read. He must show himself discriminative as well as liberal,—practical as well as enthusiastic and poetical. It is perfectly true, on the one hand, that one of the highest forms of art is the ideal; but because that is so it is no reason why we are to insist upon the limitation of the external forms of all art to those conventional types which, transcending what is natural, can fully embody the ideal. When we look at the beautiful productions of Gothic architecture, painting, and sculpture, they frequently inspire that sort of sentiment which reflects very often pure devotional feelings. At the same time, because we admire that, are we to say that no country is to go on in the study of anatomical, geometrical, or mathematical laws, and their application to the establishment of other types of art? To do so would be to neglect adding all the graces that science may bring to art altogether. It is one of the strongest points in all successful art to observe the essentially practical and technical basis upon which the artist must build, and by means of his command over which he can alone clothe his conceptions with fitting form. It frequently occurs that a great artist sets up the type of a certain form of pure beauty. It is admired, repeated, and adopted as the vernacular of his contemporaries, who, while aiming at reproduction, involuntarily modify it. By this common spontaneous system of progress those who at first admired ultimately get down, as it were, to a blunted sense in the enjoyment of it; and the type gradually becomes effete. So it is that decrepitude often affects styles which, beginning in purity, are not, as it were, fed on or refreshed by change resulting from the association of fresh external elements with those upon which the great artist first created his ideal type. In my paper I took great care to distinguish between the falling-off in the fifteenth century in the art portion of architecture and its technical part. I stated that there was never a period in Gothic architecture when the technical branches of masonry, in vaulting and interpenetration especially, attained to greater excellence. There were first-rate masons in every part of the land. The conception of a building like King's College, Cambridge, was one of the grandest in all the country; but I doubt whether any good judge of art, comparing a bay of its length with a corresponding bay from Lincoln, Salisbury, or Westminster, would not at once realise how great a falling-off had taken place in the science of proportion, and the just conception of a general harmony of parts. Who, examining carefully the sections of the mouldings, the forms of the different complements which make up the whole architecture of Henry VII.'s chapel, would be found to say that they are one-half as good as corresponding features taken from good models even of Middle Pointed work? Hence I say, and I think with propriety, that had the fifteenth-century system gone on, by spontaneous combustion alone, its "decrepitude" would have merged into "senility." Change, with consequent novelty, by an unerring cycle of revolving wants and supplies, was absolutely demanded in this country to enable it to keep pace with contemporary revolutions abroad; and had that change and novelty been arbitrarily withheld, I believe it would have been certainly fatal to national art. In its earliest architecture, after the creation of the First Pointed style, we recognise the greatest ideal excellence in England. In the reigns of the first two Edwards you find the parts, though still graceful, beginning to assume a certain amount of rigidity, and departing from the excellence which characterised the Early English work. Then you go on to the mannered work of Edward III., and to the still greater mannerism of the Perpendicular styles; so that, instead of following a ratio of progress, the onward march is in a scale of regular and uninterrupted declension. I feel, therefore, that I am perfectly justified in saying that, under the "Wars of the Roses," architecture was in a fair state of decrepitude, because it had fallen, step by step, from earlier excellence to actual feebleness. That is clearly shown by the falling-off in the spiritual forms of old religious art, with little but mannerism to take its place—by the want of power to draw the human figure or to understand perspective, and the deficiency in knowledge of classical literature; in fact, the country had been declining in intelligence and intellectual activity—a certain advance in the forms of poetical expression being perhaps excepted—for at least a century. There had been a long series of wars, and the whole land was in a feeble and exhausted state; and unless we had had Henry VIII., with an active, full-blooded, strong constitution, young and with a fresh set of sympathies, I believe the country would have gone on dropping and dropping, and, as far as architecture was concerned, would have come almost to a state of annihilation. If we had remained in ignorance of such men as Michelangelo, Titian, Leonardo da Vinci, Raffaelle, whose power no critic has been able to impugn satisfactorily, I think that we should in point of art have developed downwards till we had reached insignificance. I consider, therefore, that we are greatly indebted to Henry VIII. for what he did in this respect, and indeed in many others. There is one other point in which a little confusion of ideas seemed to prevail in Mr. Robins's mind. He appears to think that beautiful productions in art must necessarily be the productions of men of beautiful lives. That is entirely a mistake. Whoever is acquainted with the literature of the Greeks, or the Renaissance, or Mediæval literature, will find that at the very time the concretions, which we call embodiments of beauty, were given to the world, the men by whom they were produced were frequently given up to indulgence of vices and evil passions, and even refinements of sin and crime were rife. It cannot, therefore, be said that one period, whatever its art may have been, was much more virtuous than another. The great distinction I believe to be this, that generally speaking the individual may be what he likes; it is general voluptuousness in a country which is apt to produce degeneration in art. You may go as far as that, but to go further is, I think, unsound. In conclusion, allow me to thank you for the patience with which you have listened to me, and believe me that in collecting these materials my object has been solely to put certain facts together and to lay them before you, without claiming merits for reformers simply because they were modifiers of pre-existing conditions of art. It is for you to make such deductions from the facts I lay before you as you may see fit. Believe me I desire to do injustice to no style of art nor set of artists, be they Goths or be they Greeks.

NEW WORKS OF THE BOARD OF WORKS.

The Thames Embankment footway, between Westminster Bridge and the Temple, was formally opened on Thursday morning, the 30th of July. The members of the Board and their visitors afterwards proceeded to Abbey Mill, and inspected the pumping-station which has been erected there. Sir John Thwaites (chairman of the Board), Earl Grosvenor, Lord John Manners, the Hon. W. Cowper, Mr. W. Tite, M.P., Mr. Alderman Lawrence, Mr. Ayrton, M.P., Mr. Bazalgette (the engineer), and many others were present. We confine ourselves for the moment to a few particulars officially furnished. The paved footway next the river, from Westminster Bridge to the Temple on the northern embankment, together with the Westminster Steam-boat Pier, opened on Thursday, is to be 20 ft. wide, with approaches to Villiers-street, Wellington-street, and Essex-street, Strand. The roadway will be 100 ft. wide, including both footpaths, but it is not to be formed until after the Metropolitan District Railway Company shall have completed their railway, which will for a considerable length pass under the new road. The embankment road will be continued by a new street which is about to be formed from Blackfriars Bridge to the Mansion House.

About 37 acres of land have been reclaimed from the mud-banks of the river by the embankment, and will be laid out in approaches, ornamental grounds and gardens, as soon as the railway works have sufficiently advanced to admit of the execution of such works. It is expected that the embankment and railway will be completed within a year from the present time.

As to the Abbey Mills pumping station, all the sewage on the south side of the Thames, and the sewage of a portion of the north side have to be lifted, and for this purpose there are four pumping stations, two on each side of the river. Of those on the south side one is situated at Deptford Creek of 500 nominal horse-power, and the other at the Crossness outfall, also of 500 nominal horse-power; the latter was opened by the Prince of Wales in April, 1865.

Of those on the north side, the largest and most important is the Abbey Mills Station, near to Bow, in the north-east district of London. It is of 1,140 nominal horse-power.

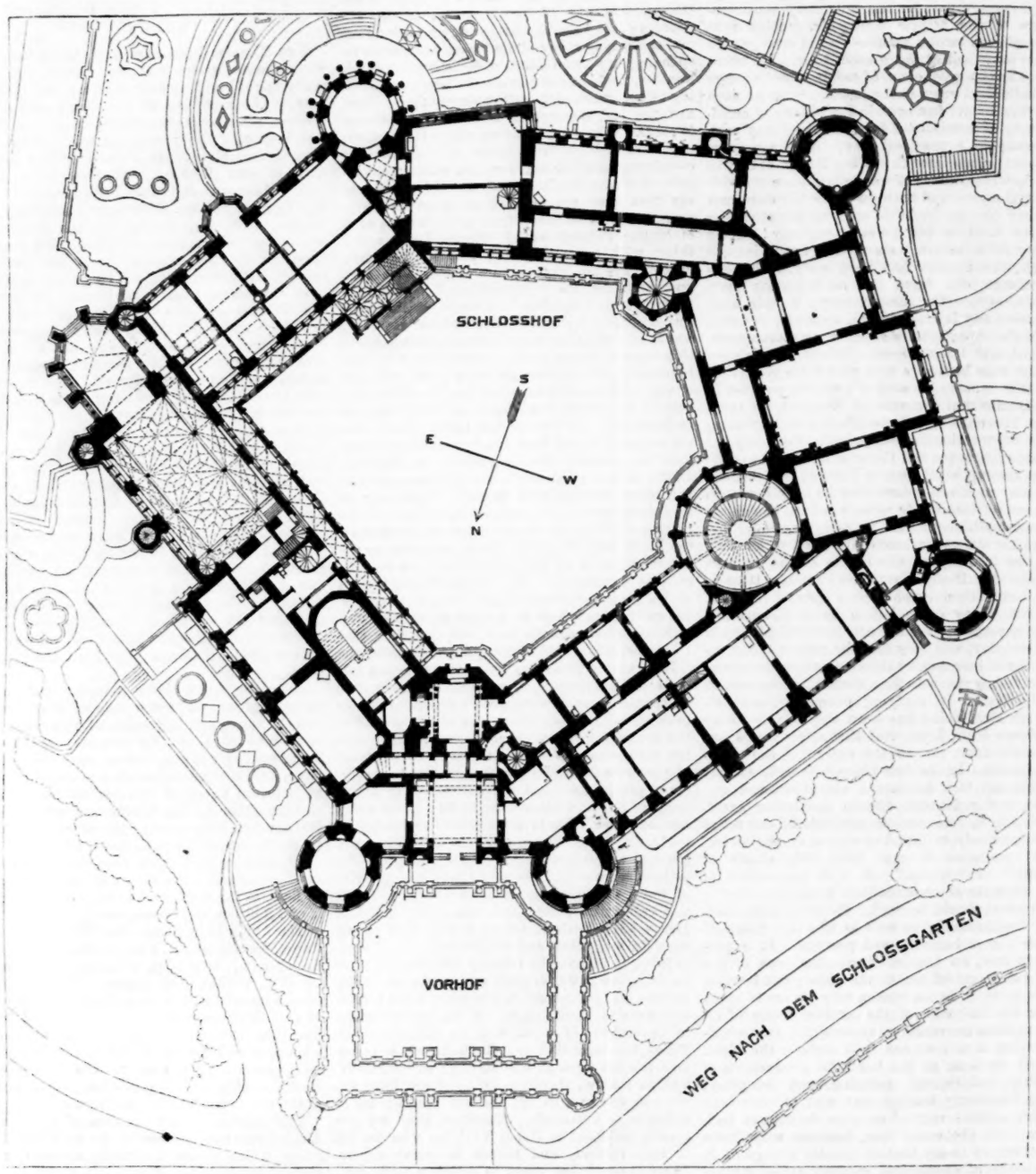
The Abbey Mills pumps will lift the sewage of Acton, Hammersmith, Fulham, Shepherd's Bush, Kensington, Brompton, Pimlico, Westminster, the City, Whitechapel, Stepney, Mile-end, Wapping, Limehouse, Bow, and Poplar, representing an area of 25 square miles, a height of 36 ft. from the low-level to the high-level sewers, whence it will flow on by the side of the high-level gravitating sewers to the northern or Barking outfall, and thus it is there are no pumps at the northern as at the southern outfall.

This station covers an area of seven acres divided into two portions by the northern outfall sewer, which passes diagonally across it on an embankment raised about 17 ft. above the surface.

On the south-west side of the embankment stand the engine and boiler-houses and chimney-shafts, together with the coal stores and wharf for landing coals and other materials from Abbey Creek. On the north-east side of the embankment are the cottages for the workmen employed on the works, and a reservoir for storage of water to supply the boilers, and condensing water for the engines.

The engine and boiler-houses form one building, the engine-house being arranged on a plan in the shape of a cross, and the boiler-houses forming two wings extending north-west and south-east of the north-eastern arm of the cross. The extreme dimensions of the building taken across two of the arms is 142 ft. 6 in., the width of each arm being 47 ft. 6 in. Each of the two boiler-houses measures 100 ft. in length by 62 ft. in width; and there is a workshop situate between the two measuring 49 ft. 6 in. by 33 ft. The engine-house consists of four stories in height, two of which are below and two above the surface of the ground, the height of the two lower stories being 38 ft., and that of the two above ground measured from the engine-room floor to the apex of the roof being 62 ft.

At the intersection of the four arms of the cross the building is covered by a cupola of an ornamental character, rising to a height of 110 ft. from the engine-room floor, and at each of the internal angles of the cross rises a turret, in



THE CASTLE OF MECKLENBURG SCHWERIN.——*Plan of Ground Floor.*

which is formed a circular staircase giving access to the several floors of the building.

The boiler-houses are of one story above the finished ground level, the boilers and stoking-floor being below that level, the total height from stoke-hole floor to apex of roof being 33 ft. The workshop between the two boiler-houses is a few feet higher, the roof being a curb roof, and that of the boiler-houses a ridge-and-furrow roof.

The style of building adopted is mixed, and the decoration consists of coloured bricks, encaustic tiles, and stone dressings, carved work being introduced at the caps of piers and columns.

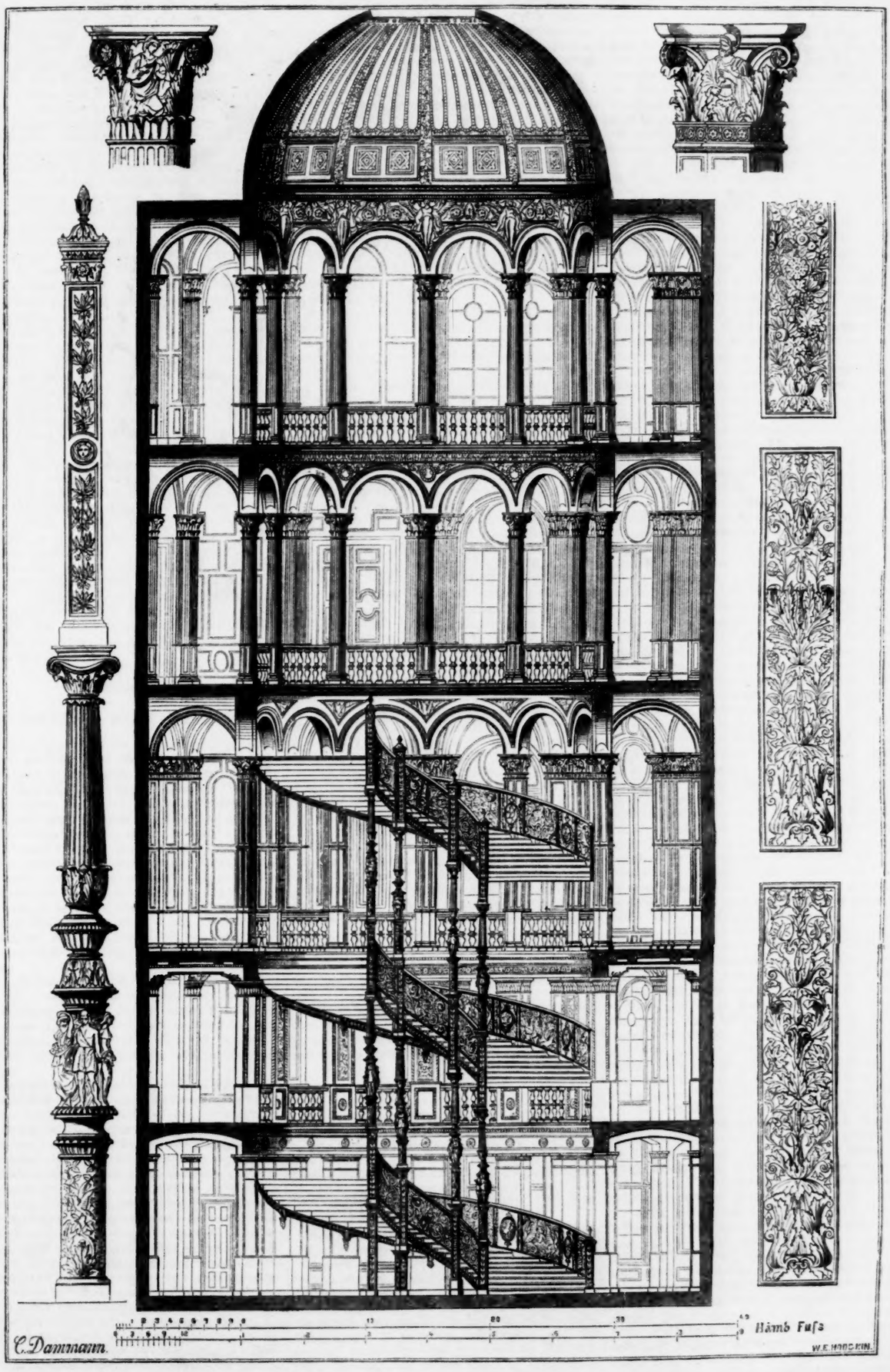
The drum of the dome, which is octagonal on plan, is supported by four wrought-iron ribs, springing from the walls of the cross at their intersection, the angles of the pyramidal roof below the drum running into and intersecting four of the eight sides of the drum. Immediately above the point of intersection the octagon is reduced by a splay, from which rises the lantern, also octagonal, each side being pierced with a large light, flanked by columns supporting arches over the lights. Above this story rises the slated roof, which is high-pitched, and is enriched at about mid-height by an ornamental cresting, and surmounted at its apex with a lofty vane.

The chimney shafts, of which there are two, one on each side of the engine-house, are 209 ft. in height from the finished surface, and 8 ft. internal diameter throughout. They are externally octagonal on plan, rising from a square battered base. They correspond in style with the main building, and are similarly enriched with coloured bricks and stone dressings, and are capped at the top by an ornamental cast-iron roof, pierced with openings for the egress of the smoke. The foundations of brickwork and concrete extend to a depth of 35 ft. below the finished surface.

The engines are eight in number, each of 142-horse power, and are arranged in pairs, each arm of the building containing one pair, placed parallel to each other lengthwise of the arms, having the fly-wheels at the entrance end, and the cylinders at the inner end of the arm, so that the eight steam cylinders are arranged symmetrically round the centre of the building under the dome.

The reservoir for the storage and purification of the water for the use of the boilers and for condensing purposes is situated on the opposite side of the embankment of the Northern Outfall Sewer. It is constructed mainly of concrete, is 18½ ft. in depth, and covers an area of about one acre, which is divided into three compartments, each compartment being used in turn as a settling pond, and containing about one million gallons; there are inlet pipes to bring water from the creek, and outlet pipes to convey the water to the supplementary reservoir under the engine-room and above the pump-well, from which it is taken direct to the boilers and to the cold-water cisterns around the condensers.

The cottages for the workmen are eight in number, arranged in pairs, each containing five rooms, and are fitted with every reasonable convenience; the house for the superintendent of the works, and which is situated on the other side of the Outfall Sewer, and near the entrance to the works, is more commodious, and fitted up in better style.



THE CASTLE OF MECKLENBURG SCHWERIN: THE GRAND STAIRCASE.—Herr Willebrand, Architect.

THE CASTLE OF MECKLENBURG SCHWERIN, NORTH GERMANY.

In the account we gave with a view of the recently completed ducal residence of Mecklenburg Schwerin, at the commencement of our present volume,* we promised an illustration of the principal staircase which leads from the ground floor to the state floor. This we now publish, also a plan of the edifice, showing arrangement of the rooms. The steps are of polished black Belgian marble, each in one piece. They rest for about an inch one on the other, and at both ends on cast-iron pillars. These cast-iron pillars are supported in the centre of the stairs by six cast-iron candelabra columns with square pedestals, standing one above another. The outer ring of these pillars rests on cast-iron shelves, which are attached to the sandstone pillars of the gallery, rising one above another. The railings are of cast-iron, the filigree ornaments being of cast zinc. The pillars rising, in the design, through all the floors, are square in the ground-floor and entresol, octagonal in the main floor, and round in the state floor and fourth floor, and are worked in all parts with their ornaments, arches, and cornices of Saxon sandstone, the natural colour of the stone being visible. The balustrades between these pillars and columns of the gallery are of polished dark-red marble; the cornices on the same again of sandstone. The iron ribs of the staircase candelabra-pillars, railings, and filigree ornaments are gilt in all visible parts. The ceilings of the galleries are vaulted and tinted, the floors are laid out in variously-coloured marbles. The walls in the galleries are stuccoed, have the sandstone colour, and are divided into squares by coloured lines. The pillars with their capitals, in the galleries as well as the main cornice under the cupola, are executed in stucco; the cupola, itself vaulted with white stone, is painted partly in grey and partly in various colours. The staircase receives light during the day partly from above, but mostly through the windows on each gallery looking towards the yard. At night it is lighted with gas in gilt chandeliers.

* See pp. 9 to 11, *ante*.

NEW SEWERAGE WORKS AT HASTINGS.

The completion of the main intercepting sewer of the new drainage works at Hastings, was celebrated by a dinner to the contractor, Mr. John Howell, given at the Queen's Hotel, on Monday last. Virtually this completion, so far as it goes, may be taken as that of the sewerage of the whole borough; as St. Leonard's proper, the western wing of the frontage, has had its similar system at work for some months past. The *modus operandi* adopted by both places may be described as the *tank* system, the whole of the sewage being conducted by a main intercepting drain to a deposit tank, whence it is discharged at such period of the tide as is favourable to carrying it clear away from the town.

At St. Leonard's this is at high water, when the set of the tide is *westward*. At Hastings, the discharge at low water leaves the flowing tide some four or five hours to carry the outpourings to the *eastward*, where it meets the outflow of the River Rother, and is dispersed to sea.

The intercepting sewer of the Hastings system extends from the Archway (the western extremity of the Local Board district) to Ecclesbourne, where the whole of the sewage of the district (with the exception of a very small portion which is drained into the St. Leonard's sewers) is discharged into the sea from the tank by gravitation, at low water. The point of discharge is about 800 ft. into the sea, and opposite Ecclesbourne Valley. The original sewer remains from the Archway to the centre of Warrior-square, and at the latter point, where there has hitherto been one of those obnoxious outlets into the sea, the new intercepting sewer commences. From that spot to the Albert Memorial the size of the sewer is 4 ft. by 2 ft. 9 in., egg shape, and has a fall of about 7 ft. per mile. From the Albert Memorial the sewer passes along Wellington-place, through Castle-street, along Pelham-place and East-parade, to the Bourne, the size up to that point being 5 ft. by 3 ft. 6 in., also egg shape. There are four branch sewers from George-street, &c., 2 ft. 6 in. by 1 ft. 8 in., egg shape, with self-acting tide flaps complete. From the Bourne to the East Groyne the size of the sewer is 5 ft. 6 in. by 4 ft., egg shape. The fall from the Albert Memorial to the East Groyne is 4 ft. per mile, and the water of the natural streams running through Warrior-square and Priory is used for flushing power, so as to prevent any deposit in the sewer. The new tank which has been constructed near the East Groyne as a receptacle for the sewage, will contain about 1,500,000 gallons, and previously to the scheme being adopted it was ascertained that the greatest gaugings of sewage, in dry weather, taken at the three outlets, did not exceed 600,000 gallons in twelve hours, leaving 900,000 gallons for slight rains. The bottom of the tank is about 5 ft. 6 in. above low water at neap tides, and 2 ft. 6 in. below the invert of the sewer. From the tank a 4-ft. cast-iron pipe runs out to the point already mentioned, 800 ft. into the sea, with a fall of from 8 ft. to 10 per mile. This will discharge 1,000,000 gallons per hour, and therefore the tank, when full, can be discharged in one hour and a half.

As a matter of fact, the whole contents of the tank, with thirty-six hours' sewage (in very dry weather), was discharged on Monday in the presence of several of the principal inhabitants and representatives of the press, in about an hour. As all the offensive outlets which have so long been allowed to pollute the bathing of this favourite watering-place and induce illness, are now stopped, its visitors may depend on clean bathing in a pure sea.

The works connected with the scheme have been carried out by Mr. John Howell, assisted by his attentive and judicious foreman, Mr. H. Butler, many years with Myers & Co. The amount of contract (which did not include the new groyne) was 25,640*l*. There were five other tenders for the work, the highest (from a London firm) being 49,850*l*., and the lowest (from Mr. A. H. Fernandez, of Tunbridge Wells), being 26,699*l*. The only part of the work which is not quite complete is the fixing of some few of the 4-ft. cast-iron pipes, by which the sewage is discharged from the tank. These pipes can only be fixed at the lowest tides, but the small portion of the work that remains in hand is now being completed with all possible speed, and its being unfinished has no injurious effect on the working of the scheme. Hastings has undoubtedly set an example which other towns would do well to follow. The importance of the undertaking cannot be over-estimated, and highly beneficial results may reasonably be expected to follow the large outlay which has been incurred. The proposal for celebrating the completion of the work by a public demonstration originated with Mr. Curling Hope, of Robertson-street, who, with a commendable degree of public spirit, brought the subject before some of his fellow-townsmen, and, with their co-operation, took judicious steps for carrying it out. The arrangements were made quite independently of any action on the part of the authorities of the town, and may be considered a compliment to the contractor and a testimony on the part of influential inhabitants that they fully approve of the mode in which the work has been carried out.

We need scarcely tell our readers that we view the works at Hastings as, after all, only preparatory, not final. The sewage must be utilised, not emptied into the sea.

MUSEUMS OF TRADE AND INDUSTRY.

The subject of Museums of Trade and Industry was discussed at a meeting convened by the Public Museums and Free Libraries Association, in the Assembly-room of the Metropolitan Club, 20, Piccadilly, on Thursday, July 23rd. Mr. John Holms, D.L., presided.

The proceedings commenced with the reading of a paper by Mr. W. H. Ablett, formerly of Coventry and Macclesfield. They all had heard, he said, a good deal of the subject of technical education latterly, and while some even disagreed as to the precise meaning of the terms, they could not have failed to notice the absence of practical suggestions, and the want of unanimity that prevailed on the subject. He appeared before them to advocate a definite plan in aid of technical education, to form its supplement, and be the connecting link between theory and practical application in manufactures, in the founding of museums of trade patterns and industrial examples. This was with him no new subject, born of the exigencies of the hour. For seven years past he had pointed out its necessity having seen many of our textile manufactures (which alone he professed to understand) slowly but surely displaced by foreign productions, owing to the want of a little extra knowledge on the part of our workmen. Persons with only a superficial knowledge of manufactures were struck with the great lack of invention and power to stimulate improvements, combined with an awkward unwillingness to depart from old-fashioned methods, that characterised not alone the managers of factories, but also the masters in many branches of English manufacture. That Englishmen were inventive, no one could deny; and that much ingenuity and mechanical skill was often manifested by entirely uninstructed workmen, was equally plain. In every manufacturing town throughout the kingdom there lay scattered about, amongst the working population, examples of attempts at something new in the shape of inventions or improvements, which were never brought under the observation of those who could practically apply them, from the simple fact that there was no system through which those attempts could come to the knowlege of the interested, excepting by chance or at rare intervals. Industrial Exhibitions amongst the workmen gave ample proof of the manufacturing ingenuity of the working population; but such exhibitions could exercise no beneficial influence upon manufacturing education, so to speak, and only served to show at times in a grotesque manner the singular misdirection the chances of life cast a man's lot in, as compared with the course whither his real bent or inclination would seem to lead him. He did not for a moment deny that in some branches of trade we still excelled foreign producers. An Englishman would ordinarily do far more work, and bring a more continuous and indomitable energy to a given task, than would a foreigner. But it was not there the weakness lay: it was to be found in defective knowledge of matters of taste and arrangement, and absence of that quickness of apprehension and that fertility of expedient, that were brought into active life only by education, and continuously sustained by daily observation. Who that recollected that we were the nation that produced such men as Shakspeare, Bacon, Milton, and Newton in the realms of thought and imagination, down to our modern school of practical engineers, could consider that we must be necessarily behind the rest of the world? What was now wanted was the wider diffusion of intelligence in the constantly recurring operations of every-day life, by which not only might the skill and talent of the workman be increased, but the mind of the workman become enlarged as to the object and application of his work, its comparative excellence or defects, &c. No means to this end existed other than those chance opportunities that failure sometimes developed; but if such museums as were advocated were established, the germ of a good thought might be perfected instead of dying away, and ideas would be suggested by other objects so as to form a complete whole of what otherwise would remain, perhaps, unutilized; not only would the eye be educated in matters of taste, but trade knowledge of almost every description could be gathered from this comparatively simple and inexpensive expedient, out of which further advantages would naturally spring. We had already to our hands all the outward machinery of a complete system. We had a science and art department, established for the art-education of the people, at South Kensington, in connexion with which the first collection of patterns and examples might well be formed to serve as a model for those provincial towns that would be disposed to adopt the plan. The standard of manufacturing skill and design would speedily be raised by such collections. They would have an influence upon taste, and positively assist a man in the commercial pursuit by which he gained a livelihood, enabling him to see what methods of production were pursued in this and other countries; how an article was started in a loom, or how an object of metal was cast,—placing him, in short, in a position to compete in the markets of the world. Of course, the details and minutiæ of these museums must be left to local or municipal management, and one would, perhaps, differ very widely from another. He would suggest, however, the adoption of some arrangement, under which a working man who had produced an invention or a new pattern could exhibit it, with his name and address

attached, with a view to arousing the emulative spirit of the working classes, and to gather together in one focus the latent intelligence of a district. Masters could then often find ingenious workmen, and the workmen, too, find masters who would take up and successfully work their inventions. The general idea of a museum was that it enshrined the past; and, as time rolled on, the collection that would accumulate would show, in a very interesting manner, the yearly progress of manufacturing and inventive skill. But it was not in that light that it would become most valuable, but in teaching men the practical business of their every-day lives, giving to each workman an idea, and perhaps eliciting one from him, which another workman would amplify. Working men must be specially interested in such a plan. Most valuable inventions and improvements were made by them, but the advantages reaped from these were often enjoyed exclusively by others. Failing to get any one to take up an invention, a workman might exhibit it in the local museum; and the publicity thus given would furnish a positive title to remuneration, which few manufacturers would have the courage to refuse, did they adopt it without due acknowledgment. Hitherto, England had competed solely with the Continent, and America was at one time one of our largest customers for goods. Latterly, the high duties there imposed acted almost as a prohibition against British importations, and an immense impetus had been given to native manufactures. Let America get into full swing, and the active ingenuity of their skilful people become fully developed, backed further by her boundless resources in minerals, cotton, agricultural produce, and coal—the latter alone exceeding by thirty times our own—and we would have another powerful competitor, whose exertions we yet scarcely felt, although the interesting statistical report sent by the Birmingham Chamber of Commerce to Lord Robert Montagu, exhibited our trans-Atlantic cousins as extensive manufacturers and exporters of such goods as wood-handled spades and shovels, hoes, axes, coopers' tools, nails, pumps, agricultural implements, sewing-machines, revolving pistols and breech-loading muskets, clocks, gas-fittings, weighing-machines, machines for domestic purposes, and a great number of what were termed "American notions." To meet these contingencies it was plain that we must call up all our own labour-power, and educate it purposely to the general advantage of the commonweal.

From the elements within us, the capital and energy of our merchants and traders, the indomitable perseverance and endurance of our artisans, who were naturally industrious and skilful, there was room to build up a grander and finer England in the future than ever existed in the past. There seemed to be something in the peculiar character of Englishmen that they never did their best until some strong opposition was brought to bear upon them; then the combative and persevering spirit of the nation was brought out, and great improvement often followed after a temporary collapse. Thus, upon first going to war with a foreign nation, we had often experienced a reverse, which, instead of acting as a discouragement, seemed to infuse new fire and spirit, with stern determination to conquer, into our management and councils; so that the check received in the first place ultimately proved to be a fortunate spur and incentive, leading to ultimate triumph. The plan of establishing Trade Museums would have a very wide application, for there was not a single branch of industry throughout the country that would not be considerably benefited by its adoption. Even in the mining districts, a museum would be desirable. The classification of the various ores, enlivened by the beautiful stalactites that abound, would form a very interesting collection, to which might be added models of machinery, and of all appliances used in mining. In the seaport towns, boats, anchors, cordage, sails, models of vessels, and marine engines, might be well represented; and these would become in time depositories of curiosities brought from abroad,—though this was the least useful aspect in which to regard the subject, unless they considered the great probability that useful fibres would be brought with other specimens, opening out new branches of industry.

While the mere workmen's Industrial Exhibitions, however worthy of encouragement on certain grounds, could have no abiding influence upon routine manufactures, and, on the other hand, the International Exhibitions were considered by many persons to have out-grown their just proportions, the proper determination and level of these expedients seemed to be indicated in the resolving of these efforts into final and permanent museums of trade and industry, to be established in all manufacturing centres, which would afford opportunities for the study and observation of the best examples of the kind of manufacture suitable to each district, and furnish an aid to technical education that could not by other means be obtained; as every clever manufacturing expedient in practical working would here be displayed, and could be readily utilized: in short, the museums would form the best descriptive supplement to technical instruction which it would be possible to devise, and if generally established throughout the kingdom would serve to mark an epoch in English manufacturing greatness.

THE PREVENTION OF DISEASES.

The tenth annual report of the medical officer of the Privy Council is, like its predecessors, a document of great interest. The volume is of considerable size, and includes a series of miscellaneous inquiries and reports, one being specially devoted to the geographical distribution and ethnological relations of consumption.

In regard to vaccination we learn that a new system of visitation, inspection of districts, and gratuities for successful operations, has been in force during the year.

The "occasional inquiries" of the Privy Council this year have extended to the outbreaks of fever at Winterton, Terling, and Guildford. All these were cases such as have again and again been reported on as "illustrations of excremental poisoning." "This filthiest chapter in the history of our pestilences," says Mr. Simon, "is one which I would gladly consider myself excused from re-opening on the present occasion." At Winterton there was disgraceful neglect, though the town four years previously had adopted the Local Government Act. At Guildford the water-supply was poisoned by sewage. At Terling the epidemic was due to conditions of local filth which existed under definite legal responsibility. The nuisance authority of the place (the Board of Guardians of the Witham Union) had grossly neglected its duty. In the space of two months a larger proportion of the population were killed by the filth-fever than ought to have died from all causes in two years. Mr. Simon suggests that if each person who suffered under these circumstances could recover his compensation from the rates, the local authorities would perhaps learn in a sharp practical way that sanitary neglect is a mistaken parsimony. So, too, he hints that, as regards commercial water-companies and the like, certain sorts of malfeasance should involve liability to pay pecuniary damages to injured persons. He thinks that in this point of view the sanitary rights of the public are but very imperfectly secured, and that explicit legislation in the matter is greatly to be desired.

NEW BUILDINGS IN KEIGHLEY, YORKSHIRE.

Mechanics' Institute and School of Art.

The erection of a large building, for the joint accommodation of the Mechanics' Institute and School of Art, has just been commenced at Keighley.

On the ground or principal floor the Institute will have its more important rooms; consisting of reading-room (at the south-west angle of the building), 33 ft. by 20 ft.; conversation-room, 28 ft. by 18 ft.; library, 33 ft. by 18 ft.; also patents room, pence bank, and secretary's office. The lecture-hall—a large apartment, 87 ft. by 44 ft., and with a wagon-headed and panelled and boarded ceiling—will be common both to the Institute and School of Art, and will seat about 700 people.

On the upper floor the school of art will be located, and will have an exhibition-room, 46 ft. by 22 ft.; mechanical room, 28 ft. by 18 ft.; painting-room, 30 ft. by 18 ft.; modelling room, 33 ft. by 20 ft.; casting room, master's room, and retiring-rooms and lavatories for each sex. The lighting of the painting-room will be to the north, and of the exhibition-room from the top. From the landing of the principal staircase leading up to this flat or story a gallery opens out into the lecture-hall before mentioned, giving accommodation for about 100 persons.

The whole of the basement story (which, from the nature of the site, will be clear of the ground on all sides) is occupied by a range of class-rooms, ten in number, and some of them of very large size; also by a tea-room, 50 ft. by 18 ft., and a residence for the hall-keeper. Separate entrances to this story are provided on the plans.

The building is so arranged that the Mechanics' Institute, the school of art, and the lecture-hall may be in operation at the same time, and yet not interfere with each other.

Externally the building will be in the Gothic style, built of stone, and with ashlar quoins and dressings.

The principal entrance will be under a tower (rising to the height of nearly 100 ft.).

The contracts for the erection have been chiefly taken by Keighley contractors, and the estimated cost with the land is about 12,000*l*. The architects are Messrs. Lockwood & Mawson.

Baths and Washhouses.

The erection of baths and washhouses for the township has just been commenced by the Board of Health, under the same architects. The accommodation provided will consist of a central office, with separate entrances and waiting-rooms on either side of the baths; two men's tepid swimming-baths (first and second class), each 60 ft. by 30 ft., with open-framed timber roofs and top lights; four first and nine second class men's slipper baths. On the upper floor and approached from either entrance (so as to be used by either sex on different days), will be a suite of Turkish baths, with a first and second class tepidarium, frigidarium, and calidarium complete to each.

The washhouse will comprise thirty double wash-tubs, each supplied with steam and hot and cold water, and with drying closets, and all requisite appliances to correspond. An engine and chimney, and a suitable residence for the attendant in charge, will complete the arrangements.

The building is Gothic in style, and the large inside baths will be treated to correspond. The contractors are wholly Keighley men; and the cost, exclusive of the ground, will be about 7,000*l*.

THE GUILDHALL, LONDON.

We described some weeks ago the window, executed by Messrs. Clayton & Bell, which has been set up in the Guildhall by the operatives of Lancashire. We may repeat that the window is divided vertically by two main mullions into three sections, the central division being subdivided into five lights, the sides into two each. The couplet division on the north side contains figures of Lancastrian worthies, and in the similar division on the south side are introduced worthies of the City. The subject of the lower tier of the central portion of the window is illustrative of the rebuilding of the City by Alfred the Great, that of the upper tier being devoted to the subject of the grant of the charter to the City of London by William I. In both cases the figures of the kings occupy the central light, the figure of the Conqueror being shown in the act of presenting the charter, which has been reproduced in the glass from the original in possession of the corporation. The two figures in the side division on the north side are full-length portraits of Sir Richard Whittington and Sir Thomas Gresham; those on the south side being of John of Gaunt (Duke of Lancaster) and Sir Thomas Stanley. Whittington, by the way, holds a skull instead of his better known insignium, a cat. At the base of the window runs the following inscription:—

"The grateful memorial of the operatives of Lancashire and the cotton manufacturing districts to the Mansion House Relief Committee, who, as almoners of a world's benevolence, distributed to them more than 500,000*l*. during the cotton famine, 1862-5, namely, William Cubitt, Lord Mayor, William James Richmond Cotton, Charles Barber, William Morley, John Armitage, G. Howes, Francis Lycett, and Stauros Dilberoglue; with Lord Mayors William Anderson Rose, William Lawrence, Warren Stormes Hale; and Joseph Gibbs, Secretary."

The window has a certain tameness. The figures of the worthies in the side divisions are larger than those of the kings in the central groups; and the feet of many of the figures are obtrusively large. Nevertheless, it is a very handsome and interesting work. The ugly glass in the west window should be removed at once; its vulgarity is now more than ever apparent.

The costly work, upon which the Corporation of London have been engaged for nearly five years, in Guildhall, is now approaching completion. From first to last in that time the Court of Common Council will have expended upwards of 50,000*l.* upon the undertaking, the finishing stroke to which is being given by the erection of a carved oak screen, and a dais at the eastern end of the hall, at a cost, included in that sum, of 2,400*l.* The subject of the restoration was first mooted in the Common Council in July, 1862, on a recommendation, which was adopted, of the City Lands Committee that the then roof of the Guildhall, which was flat and unsightly, and to which we had often objected, should be replaced by an open roof, in accordance with the original architecture of the hall. In May, 1865, in addition to grants previously made, the Court voted 1,200*l.* for the erection of a lantern and spire to the roof, and authorised the additional expenditure of 4,800*l.* odd in rebuilding four of the turrets of the hall and two of the pinnacles, and 3,080*l.* in restoring and repairing the internal stonework of the tracery under the windows. The Minstrels' Gallery, constructed of oak at the western end of the building, has cost 1,200*l.*; and the construction of staircases in the turrets to afford access to it 280*l.* The necessary works for lighting and warming the building have cost upwards of 2,430*l.* The repairing of the hall and other incidental works have involved an outlay of 1,358*l.* odd, and the lowering the monuments of Nelson, Wellington, Beckford, Pitt, and Chatham, which had become necessary, about 470*l.* The contractors from the first have been Messrs. Myers, and the works have been executed from designs by Mr. Horace Jones, the City architect.

THE PALMERSTON MEMORIALS AT ROMSEY.

These memorials have now been inaugurated. The day was kept as a holiday in the town. Earl Granville and other members of both Houses of Parliament were present, but neither Lord Russell nor Mr. Gladstone was there.

The statue occupies the exact centre of the market-place. A solid bed of concrete forms the resting-place for the statue. In digging out for the concrete some of the brickwork was discovered which, nearly fifty years ago, formed part of the then town-hall and market-house. On the concrete a few rows of bricks are laid, and on these a large piece of granite rests, surmounted by another piece, somewhat smaller. Both these pieces are rough at the sides. Next comes a flat piece of polished marble, bevelled at the sides. On this is a shaft of the same material, equally highly polished. On the front of this shaft, facing the Hundred, is merely the word,—

"Palmerston."

And on the opposite side are the words,—

"Born, 1784;
Died, 1865."

This is all the inscription the statue bears. The shaft is surmounted by another piece of scolloped marble, which gives the pedestal a complete appearance. The figure is a bronze one, about 9 ft. high, and has been cast from the purest gun-metal that could be found, by Messrs. Prince & Co., of Southwark, from a mould prepared by Mr. Noble. The right hand is slightly extended and open to a considerable extent. The countenance or likeness is considered to be good.

The triplet of lancets, also erected as a memorial of the statesman, in the west end of the Abbey Church, is of great size, the centre light being 39 ft. by 5 ft. 7 in., and the two side lights 36 ft. 6 in. by 4 ft. 2 in. each. The window has been designed by Messrs. Clayton & Bell, to exemplify the idea of Government descending from heaven to earth. In the upper portion of the three windows is a representation of the highest idea of rule—the Lord Jesus Christ sitting on the throne of glory, surrounded by adoring saints and angels. Below are three subjects from the New Testament, showing acts of power and teaching; namely, our Lord feeding 5,000, the Sermon on the Mount, and the Tribute Money. Below these, again, are three subjects from the Old Testament, illustrative of power and government; namely, Joseph distributing Corn in Egypt, the Judgment of Solomon, and Daniel as ruler. In the lower tier are figures showing allegorically three modes of action in which an earthly ruler may beneficially exercise his power:—1. In preserving peace and plenty; 2. In making war in defence of his country and of a right cause; 3. In breaking fetters and liberating captives; and at the bottom are the heraldic bearings of Lord Palmerston, and the following inscription:—"In memory of Viscount Palmerston: obiit 1865." Beneath each of the Scripture subjects is a descriptive Latin text. In an arcading dividing the subjects horizontally are demi-figures of patriarchs, prophets, kings, apostles, and saints.

HEALTH OF GUILDFORD, SURREY.

A resident in Guildford writes to us,—It is reported here that the fever has broken out very badly at Guildford again. It will be recollected Dr. Buchanan was sent down from the Privy Council Office to investigate the probable cause of the last outbreak, and which was considered to be caused by the quality of the water supplied to the town, and remedial measures were supposed to have been taken.

I do not know what they will call the cause of the outbreak now. Can it be the great heat, evaporating the sewage which for ages has been saturating the soil and the underlying chalk.

Guildford is not drained. The sewage runs into cesspools, and probably filters through them to a considerable extent. There is a drain runs down some of the streets to take the rainfall from the street gullies, and I have heard some house-drains have been connected to it. There are a good many cellars in some parts of Guildford, and if they are not well ventilated and drained it does not improve the sanitary condition of the place, especially if the soil around the cellar be saturated with sewage.

I think it is likely there may be another official inquiry as to the cause of the outbreak. I do not think fever has ever been absent from the village of Compton, near Guildford, since June, 1867; and no doubt defective sanitary arrangements are the cause. At Dunstable, Beds, it is usual to turn the night-soil and sewage into the cesspools, and dig a fresh one every time the old one gets filled up,—consequently low fever is very prevalent in the town.

NEITHER LIGHT NOR SOUND EXCEPT TO EYES AND EARS.

Having read your review of Mr. Benson's "Principles of the Science of Colour," which I soon hope to have the pleasure of reading, I am still impressed with the belief that considerable misconception regarding the theory of colour arises from not pushing our present advanced physical and physiological theories of light and sound to their ultimate conclusions, or it would be perceived that all differences in musical notes and colours are fundamentally due to quantitative or proportional differences. The proximate cause of every colour, according to received theory, is, *externally* to the sentient being, an undulation of a certain length and velocity, *nothing more*,—just as the cause of a musical sound in the ear is proximately a certain mechanical vibration of the air. Notes and colours are the effects of these on, and modified by, living organs; there is neither light nor sound independently of eyes and ears: if there be, we have yet to find the true theories of music and colour, for vibrations would clearly not then be the proximate causes they are now considered: the vulgar error lies in supposing colour to inhere in the vibrations themselves, and that it has the same objective existence that it appears to sense. No received physical theory does this. Vibrating force, then, is the real and sole *primary* of colour, and it is its variations which fundamentally produce all differences of colour: fundamentally these are differences of degree only, and not of kind. Primaries, secondaries, and tertiaries are verbal distinctions given to the phenomena produced by these mechanical vibrations in us. We do not say that these verbal distinctions are useless, so long as it is remembered that no colour is radically different from another, but that the difference is only a difference of measure.

On the subject of compensation, it appears to me that the largest generalization is the best, for fortunately every colour sensation can be tested, and its true compensation be found, by experimenting with the eye. But the old error creeps in here, and the compensating colours are discoursed upon in treatises, as if they had objective existence.

The great law of compensation which pervades nature is this:—Let

0, 1, 2, 3, 4, 5, 6, 7—8—9, 10, 11, 12, 13, 14, 15, 16,

represent the limits of a scale of variation, then we have these compensating pairs, starting from the *mean* or central eight 9 : 7, 10 : 6, 11 : 5, 12 : 4, 13 : 3, 14 : 2, 15 : 1, 16 : 0; the sum and the mean of every pair being the same. The law may be expressed more intelligibly thus:—Any aberration from a *mean* state must be compensated by a corresponding one of an equal but opposite kind, which shall re-establish the *mean* or balanced state.

I believe that colour is the result of a disturbance of the mean state of solar vibration by the prism, or other means.

W. Cave Thomas.

THE GREAT PYRAMID AND LINCOLN'S-INN-FIELDS.

It is commonly reported that the area of Lincoln's-inn-fields is the same as that of the base of the Great Pyramid of Giza; but until Colonel Vyse dug down to the base of that most ancient of structures and found the casing stones, no very accurate account of its dimensions could be given, and, consequently, no very accurate comparison could be made between its area and that of Lincoln's-inn-fields.

I enclose the dimensions of the exterior of the Great Pyramid as measured by the engineer Perring, for Colonel Vyse, with an outline in red ink of the figure of Lincoln's-inn-fields, and a scale of feet as given in the "Plan of the parishes Bloomsbury and St. Giles-in-the-fields, surveyed by J. G. Mair, esq., M.R.I.B.A." Drawn to the same scale, in black ink, is an outline of the base of the Great Pyramid of Giza, of which the superficial area is 583,696 ft., and of Lincoln's-inn-fields 511,116 ft., which leaves an excess in favour of the Pyramid of Giza of 72,580 ft.

If one side of the base of the Great Pyramid of Giza be placed against the wall of the houses on the north side of Lincoln's-inn-fields, the corner touching the garden wall of Lincoln's-inn on the east side of the area; the opposite line of the base of the pyramid will exceed the Fields by a parallelogram containing 72,580 superficial feet; no insignificant property when the new law courts are built.

	Present base of Great Pyramid of Giza	Height	Diagonal	Former base, &c.	
	746 ft.	457 ft. 9 in.	568 ft. 3 in.	764 ft.	480 ft. 9 in.	611 ft.

You will perceive by these measures that about 10 ft. of the crust of the pyramid have been removed from each face, and this work of demolition is still going on; for a rude kind of vase, for pounding the indigo plant in, is made of blocks about 3 ft. high and 2 ft. wide by an Arab mason, whose shop used to be, at the time of the Prussian mission, on the south side of the monument.

Joseph Bonomi.

THE BELLS OF THE CHURCH OF ST. MARTIN-IN-THE-FIELDS.

The steeple of St. Martin's Church is furnished with a fine peal of twelve bells in the key D, the weight of the tenor being 32 cwt. There is also a Priest's bell in the steeple.

The bells are severally inscribed as follows:—

1. Cast by A. R. 1758.
2. R. Hart and W. Chapman, churchwardens. T. R. 1770.
3. Cast by A. R. 1758.
4. [Glory to God in the highest], and on earth peace. 1725.
5. Peace on earth, and good will towards men. 1725.
6. Abraham Rudhall cast all of us. 1725.
7. Prosperity to all England. 1725.
8. Peace and good neighbourhood. 1725.
9. Prosperity to the parish of St. Martin-in-the-Fields. 1725.
10. Fear God and honour the King. 1725.
11. John Walker and John Sawcer, churchwardens. 1725.
12. Rev. R. Pearce, D.D., vicar.
Walter Turner and W. House, churchwardens. 1725.
Priest's Bell. A. R. 1725.

The old church, which was taken down in 1720, had a peal of six bells. The present edifice, by Gibbs, was consecrated on the 24th of October, 1726, and according to an item in the account of Mr. Walter Turner, church-

warden, whose name appears on the tenor, the cost of the present peal of bells, allowing for the metal of the old one, was 1,264*l.* 18*s.* 3*d.*

These bells were cast by Abraham Rudhall, a celebrated founder, in 1725-6. But the first, second, and third having been subsequently cracked, were recast in the years indicated by the respective inscriptions.

"In the year 1684 Abraham Rudhall, of the city of Gloucester, brought the art of bell-founding to great perfection." His descendants in succession continued the business, and from a list published by them—about the end of the last century—a copy of which is now before me, it appears that they had then cast no less than 4,521 church bells. The peals of St. Dunstan's-in-the-East, St. Bride's, London, and St. Martin's, Westminster, are in the number.

And here I may observe, that the Rudhalls were evidently good "Church and State people." Their bells generally bear some such epigraphs as the following:—"God prosper the Church of England;" "Prosperity to the Church and Queen;" "Free from rebellion: God save the King;" "Peace and good neighbourhood;" "God preserve our Church and State."

The belfry, or ringers' chamber, at St. Martin's, is one of the most spacious and convenient known to me, while the staircase leading to it is so admirably arranged, that one can ascend and descend without soiling a coat. This is a matter to which architects of future churches might do well to direct their attention. By the way, I should mention that, owing to the constant attention of the active steeple-keeper, Mr. Morris, the belfry is also in excellent condition.

Many remarkable performances have been given here, some of which are recorded on the tablets placed on the walls of the belfry.

Certain members of the Cumberland Society, who are accomplished ringers, meet in this belfry for practice on the first and third Friday in every month.

Before concluding I cannot refrain from making a remark with a view to set at rest the following story, which long went the round of our newspapers, &c., and which has been reproduced in England, France, and Germany during the last few years. A writer in the *Champion*, of June 3rd, 1742, says:—

"Nell Gwyn, player, left a handsome income yearly to St. Martin's, on condition that on every Thursday evening in the year there should be six men employed for the space of one hour in ringing, for which they were to have a roasted shoulder of mutton and ten shillings for beer; but this legacy is of late diverted some other way, and no such allowance is now given."

Now, as a correspondent, who published a copy of Nell Gwynne's will with a codicil in the *Athenæum* of the 26th of January, 1833, justly observes,—"No authority, beyond report, appears for this assertion." And from inquiries which I have made it may safely be said that the story is altogether false.

THOMAS WALESBY.

THE WALWORTH-COMMON ESTATE COMPETITION.

THE Walworth-Common Estate competition has ended in the premiums being awarded as follows, viz.:—

1. Messrs. McMurdie & Rust, A. Wright, and J. P. Rolfe.
2. Messrs. H. Jarvis & Son.
3. Mr. J. T. Lepard.

SIR,—As an unsuccessful competitor, I feel at some disadvantage in making any remarks on the decision lately arrived at by the Poor-Law Guardians; but, in justice to myself and a great number of my fellow competitors, I must protest against the utter inconsistency and absurdity of that decision, and the injustice that is done to a body of gentlemen who have devoted much time and labour to the preparations of the plans, which the result shows might just as well have been spared.

The facts are, that the *three prizes* offered by the guardians for the best plans *have all been awarded* to competitors *who are connected with the parish*. To this I could make no objection, if the plans selected *were in accordance* with the instructions of the guardians themselves, as printed and circulated amongst the competitors, or that they possessed superior merit to those plans which have adhered to the instructions.

On reference to the selected plans (especially the first and second prizes), it will be seen that they are entirely at variance with the instructions in *several important particulars;* whilst I and many of my professional brethren who sent in plans imagining that the instructions were given bona fide, and that the points I allude to were of importance, have taken especial pains to adapt our designs to the supposed requirements of the guardians.

It was distinctly stated that "the guardians require two good roads from 55 ft. to 60 ft. in width, to intersect the estate from west to east." Two of the selected plans do not strictly comply with that part of the instructions.

The one *receiving first prize* has the principal roads on one of his plans *only* 42, 45, *and* 50 *ft. wide*, and on the second plan only 50 ft.

The one *receiving second prize* has the principal road only 45 ft. wide, and in other parts 50 ft. wide (although marked in several places on his plan 55 ft.); and the one *receiving third prize* has interfered with the workhouse ground; but his general design is good, and is really the only one of the three deserving a prize. All the plans selected interfere with the stone-yard; and the plan receiving *second prize* shuts up Boundary-lane, which has been a public road for twenty or thirty years.

I can give you other instances, particularly with regard to the arrangement of the other roads and the building sites.

The plans *receiving first prize* show the largest number of sites, but their frontages are only 15 ft. to 16 ft., and many of them are fronting the main roads; many are only 13 ft. wide (although stated by the authors in their report, *that none are intended to be less than* 16 *ft.*). Likewise they also contain sites which are only 35 ft., 40 ft., and 45 ft. deep, and are arranged quite regardless of uniformity, ventilation, and sanitary arrangements, as required by the instructions.

The plans *receiving second prize* have six courts, from 15 ft. to 20 ft. wide, with sites 42 ft. to 45 ft. deep; also sites for houses fronting the main road not 40 ft. deep.

A lane, 500 ft. long, 20 ft. wide, with fifty-six houses introduced, which have no fore courts, and many measuring only 30 ft. and 40 ft. deep. So much for sanitary arrangements!

Plans A, C, and D, all interfere with the workhouse buildings.

So much for the selection, whilst several of the rejected plans have strictly complied with the instructions, and contain nearly as many sites, with frontages of 18 ft. to 20 ft., and depths not less than 55 ft. to 60 ft.

I think I have said enough to show the folly of a professional man, a stranger to the members of the Board, attempting bonâ fide to compete under such circumstances, and to devote time and labour only to find himself stultified in such a decision as the one arrived at.

If the plans had all been sent in under mottoes, and had been examined and decided upon, *with the assistance of a professional man, as suggested both* in the *Builder* and to the guardians themselves, there would have been a very different result; at any rate, the unsuccessful candidates would, I am sure, have been better satisfied than they are likely to be.

It just comes to this, that the guardians have issued instructions which they have not abided by, in their decision, as they have so far altered their views as to but a number of gentlemen, whose time might have been much better employed, into an extremely false position.

As the plans are to be open for inspection at the Walworth Vestry *this week*, I fearlessly refer the rate-payers of the parish, or any professional gentleman, to the plans selected, and beg that they will compare them with the rejected ones, and the facts stated in this letter.

If the guardians have decided in error of the measurements here referred to, let them, in justice to the other competitors, and for the sake of future competition, re-examine and reconsider all the plans *with professional aid*, and a "true verdict give" according to merit.

FREDERICK A. KLEIN.

THE ARTISANS' DWELLINGS ACT.

MR. TORRENS thus explains the provisions of the Artisans' Dwellings Bill—a measure which has now become law:—

The duty of inspecting abodes unfit for human habitation is still laid upon the officer of health; and the independence of that officer is fortified by his being made irremovable without the consent of the Government. A competent surveyor is to be required to say whether the dwelling is capable of being made wholesome by any and by what repairs, or whether it must be pulled down and rebuilt. In either case the owner of the property is to have the option of doing the necessary work. If he declines, the vestry in the metropolis (or the corporation elsewhere) is empowered and directed to have the repairing or rebuilding properly done; and, in case of neglect or delay, appeal may be made by the ratepayers to the Secretary of State for an order compelling the local authority to do its duty. The money is to be obtained from the Public Works Loan Commissioners, at 4 per cent., as originally proposed in the Bill as it left the Commons; but, instead of the compulsory purchase of the premises and its re-sale at the end of five years, the Lords have preferred to give us a compulsory mortgage until the loan from the Treasury shall be paid off.

LIVERPOOL BY A NEW INHABITANT.

SIR,—In an article in your journal recently, it is stated that the mortality of infants under five years of age in Liverpool is equal to 50 per cent. By the registrar's weekly return just published, we find that the death-rate of the population there is over 33 per 1,000, and by general consent this city is a most unhealthy one at all times, but especially at this season of the year.

There appear to me to be two causes for this, the first and principal of which is the want of proper sanitary arrangements. Water is here in abundance, and laid on every day, and all day at a high pressure; but—and it will scarcely be believed—it is only within a short time, I am told some two years at most, that water-closets have been introduced into the town, and even now only into the best houses. The great majority of the houses have in their back yard a privy and an ash and garbage pit combined, called in the vernacular a "midden." These middens are usually allowed to become full before they are emptied, which generally takes from two to three months; and as they are quite uncovered, their contents seethe and bake in the sun during that time, fouling the atmosphere with poisonous gases, quickly producing in the strongest men cholera, choleraic diarrhœa, low fever, and other similar diseases, which in the weak mostly end in death.

Another result of this state of things is, that flies are produced in such abundance that they are like the plague in Egypt; they enter the houses, and may be killed and carried away by the shovelful, and in the courts and alleys they rise like a cloud. The corporation have recently become aware that this state of things is not quite right, and have begun to move in the matter. They have invited every house-owner in the town to connect his "midden" with the common sewer, and to send in the bill to them, to which great objections appear to have been raised.

That, sir, appears to be the estimate they have formed of their responsibility. Liverpool is forty years behind London in this. Another cause of the great mortality is undoubtedly the drinking customs of the place. I never saw or heard of a town with so many public-houses and beer-shops in it, some of them, no doubt, selling good liquor and being well conducted, but many of them low and poisonous, both physically and morally. At least two-thirds of these houses might be closed with great advantage to the public.

I wish, sir, that you could be induced again to visit this city, and that your powerful pen might be used to strike "Another Blow for Life," and bring some people to their senses. I, for one, shall certainly refuse to expose the health of my family to such risks as I have mentioned by living in the town. Cannot something be done to help those who are obliged to remain here?

E. G.

MR. SAMUELSON'S EDUCATIONAL COMMITTEE.

THE Select Committee, moved for by Mr. Samuelson, and appointed "To inquire into the Provisions for giving Instruction in Theoretical and Applied Science to the Industrial Classes" have issued their report, which results in the following among other conclusions:—

That adult science classes, though of great use to artisans, to foremen, and to the smaller manufacturers, cannot provide all the scientific instruction which those should possess who are responsible for the conduct of important industrial undertakings. That all whose necessities do not oblige them to leave school before the age of fourteen, should receive instruction in the elements of science as part of their general education.

That the re-organisation of secondary instruction and the introduction of a larger amount of scientific teaching into secondary schools are urgently required, and ought to receive the immediate consideration of Parliament and of the country.

That it is desirable that certain endowed schools should be selected in favourable situations for the purpose of being reconstituted as science schools, having in view the special requirements of the district; such schools to be rendered available to the surrounding districts, by the establishment of exhibitions open to public competition; so that the children of every grade may be able to rise from the lowest to the highest school.

That superior colleges of science, and schools for special scientific instruction requiring costly buildings and laboratories, cannot be supported by fees alone, without aid from one or more of the following sources; namely, the State, the localities, and endowments or other benefactions.

That such colleges and special schools are most likely to be successful if established in centres of industry.

That some slight addition to the emoluments of science teachers would probably tend materially to promote the establishment and permanence of elementary science classes.

That the provisions of the Public Libraries and Museums Act should be altered so as to enable public bodies to levy a slightly increased rate for scientific purposes.

That the masters of training colleges for the teachers of elementary schools should give special attention to the instruction of those teachers in theoretical and applied science, where such instruction does not exist already.

That teachers in elementary day schools should be paid on results for teaching science to the older scholars, in the same way as payment is now made for drawing in such schools. That the education of higher science teachers should be encouraged by the granting of degrees in science at Oxford and Cambridge as at other Universities, and by the opening of a greater number of fellowships to distinction in natural science as well as in literature and mathematical and moral science.

That a more intimate connexion between the various Government institutions for scientific instruction in London would increase the efficiency of each of these institutions, and that their constitution and management and their future relations to each other require further consideration."

THE TRADES MOVEMENT.

Rattening in Birmingham.—A notice, it appears was recently posted up throughout the town announcing,—

"That on Wednesday last some evil-disposed person maliciously cut one strand of a large rope used for hoisting heavy blocks of stone at the new Birmingham and Midland Bank, now in course of erection in Stephenson-place, with intent to cause injury to the workmen, and that the act was providentially discovered in time to prevent any injury being done."

Had this not been detected before the raising of the stone there is said to be little doubt that the men beneath must have been fearfully crushed. The stonemasons now employed at the building are non-society men, who have supplied the place of the society men at present on strike.

The Birmingham Stonemasons' Strike.—The Birmingham masons have published a letter, addressed to the public, giving a *resumé* of the causes that have led to the existing strike. In relation to the worked stone rule, which is the main point of dispute, the letter justifies the proposed rule. It says:—

"Supposing the master builders of Birmingham had all the stone worked in the quarries, what would become of the greatest portion of the masons now required in the town? They would be compelled to break up their homes, and take up their abode in the vicinity of the quarries, thus debarring themselves of all those privileges they can

avail themselves of in the town, such as the noble institutes, the Fine Arts Gallery, and other available sources of education, which are the principal means of lifting men from the degrading position of serfs, and making them become good artisans and respected members of society. And not only themselves would be debarred those privileges, but it would be the means of keeping their children in that state of ignorance which the selfish and sordid-minded portion of the community would like to see. The builders do not let the public know that we do not object to the stone being scabbled out to skeleton moulds at the quarry. The wages are lower in those districts, and they could get the stone worked in its green, sappy state, at a little less cost. The old custom of our trade to work the stone at the building affords more time for it to become seasoned, and enables the architect or clerk of the works to better judge of the quality of the material, and to guard against all rents and shakes, which could not be so well detected after being worked at the quarries and exposed to the atmosphere and dirt in its transit to the building. In the end, our worked stone rule would prove the most economical and advantageous to the public."

The "Rattening" Case in London.—In reference to this case the *Worcester Herald* says,—

"Mr. Potter took upon himself the responsibility of stating that trades societies do not object to piecework; that the societies name the minimum price of labour; and further, that the mere fact of a man being a member of a society constitutes a guarantee that he is an efficient workman. Mr. Gladstone will now see that Mr. Potter and the delegates were deceiving him. The men themselves are now openly denouncing piecework, and threatening their employers with the horrors of the rattening system unless they accept a labour tariff dictated by only one party to a contract supposed to be entered into for the production of mutual advantages to all concerned. Mr. Potter informed Mr. Gladstone that payment by piece was impracticable in some trades, and he may be right; but in most trades it is the fair system, we might almost say the only fair system. But it is not because payment by piece may be impracticable under exceptional circumstances, that the trades unionists object to it. The objection to piecework is really because it infringes upon the great end and aim of the unionists—the enforcement of a uniform rate of wages fixed without regard to the capacity of the individual worker. Nay, more, it has been argued by experienced writers on the question, that as an able worker will make more money than a careless or an unskilful man, it is to the interest of the unskilful that the societies actually look; if not, why do they denounce the piecework system? Skilled workmen have nothing to fear from its adoption. How can mere membership constitute the guarantee for which an employer of labour has a right to look? Do candidates for admission to trade societies undergo an examination, or submit their skill to a test before a committee of experienced workmen? Certainly not. We know a man is admitted a member of his trade society without reference to his capacity, upon his furnishing proof that he has served a regular apprenticeship, or fulfilled certain requirements in which time and the payment of subscriptions supersede all considerations of workmanlike capacity."

Let us hope that these cases of "rattening" will be repudiated by the majority of the trade societies, and that philosophers and philanthropists will be left to carry out their good intentions, and so unite the interests of capital and labour that all remembrance of disputes between employers and employed may be lost in a complete restoration of mutual goodwill and mutual confidence.

THE PROPOSED LAW COURTS.

A FORMAL protest against the injustice of the award as to the appointment of the architect of the proposed Law Courts has been forwarded by Mr. E. M. Barry to the Treasury. In requesting our attention to it Mr. Barry says,—"It seems to me that the question of a just or unjust termination of so important a competition possesses an interest and involves a warning to the profession at large no less than to myself." We think so too, as we have already said, and should feel surprised but for past experiences that the profession as a body have not uttered a strong protest against the decision that has been arrived at. If Mr. Street had been treated as Mr. Barry has been treated, we should say precisely the same thing. The strongest evidence was borne to the correctness of our views by the late Lord Cranworth, who signed the conditions as Lord Chancellor, under whose auspices they were issued thus signed to the competitors, and whose authority respecting them cannot therefore be disputed. His Lordship stated—

"It was due from him to Mr. Barry to say that he was perfectly right in representing that the instructions given to him were to attend almost exclusively to matters of internal accommodation, convenience, and arrangement. It was due to Mr. Barry to remind their lordships of the prominence given to all questions of internal arrangement. *Prima facie* it would certainly seem that Mr. Street should be the architect of the National Gallery, and that Mr. Barry ought to construct the Courts of Law."

Mr. Barry in his protest says:—

"The conditions provide, (1), that the architect who shall acquit himself the best shall be appointed; they point out, (2), that, in deciding who is the best, 'utility is to be preferred to effect,' and good internal arrangements shall be considered paramount, 'superseding so far as they may conflict all considerations of architectural effect;' and they further provide, (3), that the decision on these points of the judges appointed by the Government shall be 'final.'

With reference to any claims of other competitors, and the remarks to my prejudice, contained in Mr. Street's recent memorandum, I think it right to repeat emphatically that such claims and remarks are based entirely on departmental reports by committees and others who were *not the judges*, but only some of their professional advisers, and that I rest my claims on the decision arrived at *by the judges themselves*, with the opinions of all their advisers before them, that '*Mr. Barry's design is the best in regard to plan, and the distribution of the interior.*' This decision we were promised should be final, and it is not necessary for me to defend it. I may, however, quote, as illustrating it, the separate report of Messrs. Shaw and Pownall assigning to me a preference under forty-one heads against three in favour of Mr. Street, and including in the former every one of those points which the competitors were told were of vital importance, such as light, air, quiet, accesses, staircases, general arrangement, &c. This report in no way supersedes, though it serves to explain, the decision of the judges, by showing in detail the views entertained by the two professional judges who may be supposed to have especial qualifications.

Few non-professional persons can have a just idea of the amount of time, labour, and anxious study I have found it necessary to bestow on this work, so as to provide conveniently and satisfactorily for the vast extent of accommodation required, the printed details of which extend over eighty-three foolscap pages, and include sixty-six schedules, with twenty-four courts, and more than 1,000 rooms. . . . .

I did not hesitate to incur the anxious labour of this competition to the detriment of my private engagements, because I relied implicitly on her Majesty's Government to carry out strictly and equitably the promises which they had made in order to obtain my designs, and because I felt sure that they would recognise the moral claims as well as the legal rights of the competitors. It did not occur to me as possible that the Government could allow me to so devote myself, and, after having received from me all I had to give (viz. my designs), and being thus in possession of all the advantages of the contract between us, would declare that they do not on their part consider themselves bound to keep their engagements, on the faith of which my designs were furnished, but hold themselves free to disregard the decision of the judges, which they promised should be final, and to make any appointment they may think proper as if the conditions had never been written and issued under the auspices of a Royal Commission, with the signature of the Lord Chancellor (Lord Cranworth), formally attached to them."

The course which has been taken is not only highly injurious and unfair to Mr. Barry, but is calculated to have a most prejudicial effect on the public interest; for it is difficult to see how, in the event of future competitions, it will be possible for architects again to repose confidence in the just and equitable adherence of the Government to the conditions prescribed by themselves, and agreed to by the competitors as a contract between the two parties. Is it yet too late to obtain justice?

HARBOURS AND DOCKYARDS.

MEMORANDA by Lieutenant-Colonel Clarke, R.E., director of works, have been issued among the Parliamentary papers, explanatory of vote 11 of the navy estimates. From these memoranda we make a few extracts, first remarking that the votes asked for Deptford, Woolwich, and Sheerness Dockyards are, looking to the proposed eventual suppression of those establishments, limited to such sums as are requisite for the maintainence of the existing structures, and for the effective and economic completion of the current work on the building, repair, and fitting of ships, until the new works at Chatham are sufficiently advanced to admit of those services being undertaken at that yard:—

Chatham Extension.

My estimate of January, 1865, for the execution of the works approved by Parliament in connexion with the extension of Chatham Dockyard, amounted to 1,750,000*l.*, to be reduced in proportion as convicts are more or less employed. The further experience we have had in dealing (as we have been doing) with a treacherous and uncertain soil, leads me to hope that it is correct. Up to this date 540,000*l.* have been expended, of which 265,000*l.* have been paid for the supply of plant and material for the employment during the last year of from 700 to 1,100 convicts, whose labours are supplemented and led by from 250 to 350 free artificers and labourers.

Portsmouth Extension.

The Admiralty did not obtain final possession of the site for this work till 1866, and the first contract was let from April 1st, 1867, the necessary preliminary work of making a new boundary wall having been done in the interim. Arrangements for the yield of not less than 20,000,000 bricks a year by convict labour have also been made, and that number will this year be produced. Five hundred and seventy convicts are employed in brickmaking: the remainder, being artificers, are occupied in preparing plant, and in making and repairing tools, &c. Their labour has been supplemented by twenty steam-engines, applied to brick machines, pile-engines, mills, lifts, &c.

Devonport and Keyham.

At Devonport and Keyham the proposed expenditure this year is confined to what is required for additional machinery and the current charges for the efficient working and maintenance of the establishment.

Haulbowline.

The Irish Government, since November, 1867, having increased the number of convicts from 270 to 467 men, with 100 free artificers and labourers, these works are now making better progress. Tenders have been invited, and are under consideration, for the construction by contract of the eastern wall and embankment. The expenditure so far incurred amounts to 26,000*l.* (including 500*l.* for the purchase of Rat Island, which was private property), of which 7,000*l.* have been for plant, as steam travellers, steam pile engines, pumps, &c., and 13,000*l.* for timber and material, 5,000*l.* for the wages of free mechanics, and 1,000*l.* for superintendence. Workshops, stone-cutting sheds, and overhead travellers have been erected, and the requisite rails laid down. By a timber viaduct, 2,500 ft. in length, I have connected Haulbowline with Spike Island, to avoid the difficulties and danger of bringing the prisoners to the works in boats.

Portland.

For Portland harbour, which may now be regarded as the head-quarters of the Channel fleet, and which will probably become, in time of war, the point of departure and rendezvous for our fleet when taking the sea against an enemy, rapid and most efficient coaling arrangements are wanting, and a sum in the current year amounting to 2,000*l.* has been taken for commencing them.

Marine Barracks.

The extension of and sanitary improvements to the several marine barracks, which have of late years required large votes, are now approaching completion, and the sum asked for this year is limited to 15,400*l.*, the principal item being 3,000*l.* towards the erection of quarters for married marine soldiers, and 5,000*l.* towards the additional accommodation for officers and men at Plymouth.

Gibraltar.

At Gibraltar convicts only are employed, and the sum taken is limited to the amount sufficient to provide plant and a small number of free artificers for the further progress of the mole on the east side of the Naval Harbour. A mole has also been proposed on the north side, but the details have not yet been prepared.

CASES UNDER BUILDING ACT.

Clerkenwell Police Court.—On Friday, the 24th instant, Mr. Albert N. Bryett, builder, of 116, St. James-road, Holloway, attended at this court to answer a complaint preferred against him by Mr. John Turner, district surveyor of the eastern division of Islington, for erecting a building at the rear of No. 36, Grove-road, without first having given two days' notice to him, as required by the 38th section of the Metropolitan Building Act.

This case had been adjourned on two previous occasions, to enable the defendant to receive a reply from the Metropolitan Board of Works, to a complaint he had made in reference to the proceedings taken by the district surveyor in respect to the said building.

Mr. Joseph E. Turner appeared for the district surveyor, and Mr. Ricketts for the defendant. It appeared that on the 23rd of April, 1867, notice was given by Mr. Bryett, of his intention to erect six houses, shops, and additions in the Grove-road. The size of each of the proposed buildings given in the notice was equivalent to an area of 540 superficial feet. In November last the roof of the house, No. 36, Grove-road, was covered in, and the building as then carried out, was found to contain an area of 956 superficial feet. In the month of January last the district surveyor had occasion to visit the premises, when the house was occupied, and an oven had been erected by another builder; and on the 27th of April, 1868, he discovered the building in question begun at the rear of the house, and for which he required notice, which had not been given. The sections relied upon by the solicitor for the district surveyor, were the 9th, 27th, 38th, 40th, 41st, &c.

On the part of the defendant, it was contended that works were going on from time to time on this and the other houses included in the original notice, and that even at the present time all the houses were not thoroughly finished, and that the building in question was simply a coal cellar, of about 7 ft. high, and was included in the description of "additions" contained in the original notice of the houses. He also contended, that although this house was "covered in" at the time stated, yet as the remaining houses, for which notice had been given, were not in such a forward state, this house could not be considered to be completely finished, and that according to one of the interpretation clauses of the Act, the term "area" of a building was not to include "attached buildings," the height of which did not exceed the height of the ground story.

The magistrate (Mr. Barker) decided that as the house was proved to have been covered in at the time stated, and taking into consideration that the area given in the notice for the houses was considerably exceeded, although the other houses might not have been completed at the same time as No. 36, Grove-road, yet to all intents and purposes each house, although included in one notice, must be considered as a separate building; the rules of the Act applied to each individually, and the work complained of having been commenced after the roof of the house No. 36, Grove-road, had been covered in, notice should have been given to the district surveyor. He should, therefore, impose a nominal penalty of 5*s.*, and award 2*l.* 2*s.* costs.

Mr. Ricketts stated he was instructed to ask for a case, which was granted.

The district surveyor's solicitor informed the magistrate that the decision of the Metropolitan Board of Works on the complaint made by Mr. Bryett was in accordance with his (the magistrate's) decision.

THE PROPOSED NEW MECHANICS' INSTITUTE AT BRADFORD.—The contract by which the Corporation of Bradford dispose of 1,000 yards of land at the corner of Bowling-green and Tyrrel-street, at the price of 12*l.* 10*s.* per yard, for the erection of a new building in place of the present Mechanics' Institute, has been concluded. Messrs. Andrews, Son, & Pepper, architects, Bradford, have been selected to prepare the designs.

MONUMENTAL.

In the House of Commons, Mr. Roebuck, after making some remarks very eulogistic of the late Lord Brougham, asked the Premier whether it was the intention of the Government to erect a monument in Westminster Abbey to the memory of that illustrious man. Sir G. Bowyer said he hoped that his lordship's remains would be brought from Cannes and deposited in the abbey. Other members spoke, including Mr. Gladstone, and Mr. Disraeli said that the Government were considering the best means of doing honour to the memory both of Lord Brougham and of Professor Faraday, and explained that the delay had been occasioned by the lamentable decline in this country of the sculptor's art.——It has been determined by the subscribers to the original fund for the memorial of the late Lord Holland in Westminster Abbey to devote the sum remaining, which amounts to about 2,600*l.*, to the erection of a statue of his lordship on a site offered by Lady Holland on the south side of Holland Park, adjoining the Kensington-road.

FROM SCOTLAND.

Edinburgh.—The foundation-stone of the first Established Church which has been built in Edinburgh since the Disruption in 1843, has just been laid. The edifice, named the West Coates Church, is intended to supply a want which the increase of population in the western part of the city has created, and its provision is the result of public subscriptions. There are already two Free Churches in the district—the Roseburn Church, built some time ago at a cost of 4,000*l.*; and Free St. George's in Stafford-street. The estimated cost of the structure is 7,500*l.* Of this sum rather less than 2,000*l.* only remain to be collected, the public subscriptions amounting already to 3,000*l.*, and a donation of 2,500*l.* being contributed by Donaldson's Hospital, for accommodation to be afforded in the church for the inmates of that institution. The site of the church is on a piece of ground belonging to Heriot's Hospital, adjoining the east corner of the Donaldson's Hospital ground, but separated from it by a road leading to the proposed feuing ground, and by a belt of plantation. The edifice is being built according to plans by Mr. Bryce, architect. It is of freestone, in the later style of Pointed Gothic, and to some extent will be cruciform in plan. The centre portion or nave is allotted to the general congregation; and the two aisles, with the galleries in the aisles, are to be appropriated by the inmates of Donaldson's Hospital. The church will be entered from the Coatbridge road, and exit doors from the galleries will be provided on either side for the general congregation. The entrances to the transepts are provided for by octagon turrets with staircases. Towards the front the structure is gabled; and there will be a spire and tower rising to the height of 130 ft. The tower is in three stories, the first story being lighted by a traceried window, and the upper stories by triplet lancet windows. The spire is pierced by two stories of spire-light windows, and is surmounted by an ornamented finial and vane. The roof is in a single span, framed with main couplets. The seats are not to be enclosed with doors, but are to have open bench ends, and they will be wider than the seats usually are in Presbyterian churches. The pulpit is to be placed at the north gable, and behind it will be a vestry and other accommodation. The pulpit and platform in front of it will be panelled, as will also a portion of the wall behind. This north wall will be lighted by a rose window immediately above the pulpit, and by two side windows. The church will accommodate 900 persons; and the estimate of the total cost of the building already given includes all outside work.

Perth.—A grand Masonic demonstration has taken place at Perth, upon the occasion of laying the foundation-stone of Messrs. John Shields & Company's new power-loom weaving factory. The buildings, now in course of erection, are situated on the property of the Earl of Kinnoul, at Balhousie, a short distance to the north of the Perth Cavalry Barracks. When completed, the factory buildings will cover upwards of five acres of ground, and contain 400 looms, as also refreshment and reading rooms for the workers, and the usual necessary adjuncts to so large an establishment. The total cost of the erection of the factory will be about 20,000*l.*

Dumfries.—The foundation-stone of a new United Presbyterian Church has been laid at Waterbeck, near Keithbridge, Dumfries. The church, which will accommodate 381 sitters, will be in the Early English Gothic style, and will be formed of nave and transepts. The site is a short distance to the north-east of the present church. A manse is also in course of erection. The sites and the whole of the stone required for the buildings have been given free of charge. The cost besides is estimated at 1,868*l.*

CHURCH-BUILDING NEWS.

Hale, near Farnham.—Hale Church, built about twenty years ago, in the Norman style, and which had a north aisle added to it in 1861, has recently been again enlarged by the prolongation of the chancel, and by a chancel aisle. A western porch has likewise been built. Messrs. Goddard & Son, of Farnham, were the builders; and Mr. Ferrey, the architect.

Ashwell, Herts.—St. Mary's Church has been re-opened. The successive efforts at restoration made during the incumbency of the present rector have been directed towards beautifying the interior without destroying the original Gothic character of the building, and these are now completed; though a large expenditure is necessary to repair and arrest the ravages of time upon the work done by the Freemasons of the thirteenth century. Soon after the appointment of the present incumbent, the Rev. H. W. Hodgson, he set to work to restore the chancel, and this was effected for 330*l.* Subsequently the rector's father (Mr. C. Hodgson) restored the south porch at a cost of 120*l.*, hoping that this might lead to some more extensive improvements. The churchwarden (the late Mr. John Sale) about the same time paved the whole of the nave with York stone, and not long ago a painted window was placed at the east end of the south aisle by Mr. C. Tinling, to the memory of his wife. During the past year still further alterations have been made. Supported by his parishioners and other friends, the rector has been enabled to place an organ in the church, at a cost of about 400*l.* Under the advice of Mr. Shilcock, of Hitchin, architect, they removed all the old pews, substituting open seats, which have been made by Mr. Seymour, of Hitchin. The expenditure for this and some extras is estimated at 400*l.* In addition to this Mrs. Hodgson has presented the parish with a stone reredos, the centre panel of which contains a sculptured representation of the Lord's Supper, from the painting of Leonardo da Vinci: the design was furnished by Mr. A. Ashpitel, architect; and the stonework was executed by Mr. James Chapman, Lambeth-road. The cost was 80*l.*

Tunstall.—The new cemetery, which has been prepared for the town of Tunstall, or rather the Episcopal portion of it, has been consecrated by the Bishop of Gibraltar. The site of the new burial-ground is at Clay Hills. It is on the slope of a hill on the west side of the town, and close to some large ironworks in the valley below. The cemetery is enclosed at present by a light iron fence, and has been laid out by Mr. Matthews, of Milton, from designs prepared by Mr. R. Dain, architect, Burslem, the walks and drainage being done by Messrs. Smith, Hanley and Newcastle. The extent of the cemetery is about seven acres, the land having been purchased from Messrs. Williamson and Mrs. Clive, at a cost of between 3,000*l.* and 4,000*l.* The chapels are not to be erected until time has been allowed for the subsidence of the ground from mining operations. About half the ground has been set apart for the burial of persons according to the rites of the Church of England.

Lichfield.—The foundation-stone of a memorial church to the Right Rev. John Lonsdale, D.D., late Bishop of Lichfield, is to be laid in the cathedral city, by the Right Hon. the Earl of Lichfield, the lord-lieutenant of the county of Stafford, assisted by the Right Worshipful G. S. Tudor, D.G.P.M., and the principal grand lodge of Freemasons of Staffordshire. After the ceremony there will be a public luncheon at the Guildhall, under the presidency of the Earl of Lichfield.

Ivegill.—The newly-erected church at Ivegill has been consecrated by the Bishop of Carlisle. The church is called Christ Church, and has been built at the sole expense of the Rev. A. E. Hutton, of Stockdalewath, the incumbent of the chapelry, from the designs of Mr. R. J. Withers, of London, who superintended the work. It is a small edifice, and outwardly presents few attractive architectural features. It has, however, the advantage of being very pleasantly situated. The church, which is Geometric, and capable of holding 116 persons, consists of a nave and chancel, south porch, vestry, and heating chambers underneath, and at the west end rises a bell spirelet of white shawk stone pierced for three louvres. The interior is decorated. The windows in the nave and chancel are filled with stained glass, by Mr. A. O'Conner, of London. The east window has three lights, and is filled with a representation of the Last Supper. In the small round lights above are delineated angels adoring, and the lamb and flag. The lower part of each panel is filled with tracery. The two west windows, both of which have two lights, contain pictures of the Evangelists and the four major Prophets, Isaiah, Jeremiah, Ezekiel, and Daniel. The reredos is of oak, in nine panelled compartments. Six contain, on zinc panels, illuminated, the Ten Commandments. These are the workmanship of Mr. Creighton and Mr. Scott, of Carlisle. The pulpit and font are of stone. These, as well as the general details of the church, have been executed from designs furnished by the architect. The contractors for the building of the church were Messrs. Robert Hope and George Little, of Dalston. The church is faced with white shawk stone, but is chiefly built of Ivegill stone from the quarries of Mr. Thomas Nelson, of Penrith, who gave the stone not only for the church, but also for the parsonage-house now in course of erection near the edifice.

Montgomery.—The works in the parish church, which have been in progress during the last four or five months, are now nearly complete. They include the restoration of the Perpendicular west window, which was in a very dilapidated and dangerous state. The whole of the stone work has been removed and replaced by new work, in exact *facsimile* of the original, and filled with cathedral tinted glass. In addition to this, the roof timbers of the nave, which are of oak, have been cleansed of the coat of colour with which they were covered, and scraped and oiled. This roof is of open work, both in the west end of the nave, and in the chancel, with a wagon roof in the east end or intervening portion of the nave, the intersections of the woodwork of the latter having coloured bosses, which have been restored and recoloured. The red sandstone quoins of the windows of the nave, the north transept, and the Lymore Chapel, and the stonework of the old west door, have been scraped, repointed, and restored. The Earl of Powis has alone borne the expenses attendant on the works in the interior of the Lymore Chapel, including the removal, underbuilding, and restoration of the pillars and arches, which separate it from the nave. The exterior of the chapel has also recently been restored at the cost of his lordship. In cleansing the interior of the walls of this chapel, from the whitewash with which they were covered, a curious old painting was discovered, representing the Resurrection; and it is still exposed. In this chapel, which contains a piscina and small hagioscope window, the only existing remains of its former use as such are two very old recumbent male figures in armour, but without record of either name or date, and a monument to Sir Richard Herbert, and his wife, the parents of Lord Herbert, of Chirbury, and George Herbert, the poet and divine. The whole of the works have been carried out by Mr. Morgan, of Llandinam, under the superintendence of Mr. Edward Haycock, junior, of Shrewsbury, whom Lord Powis had previously employed in the restoration of the exterior of the Lymore Chapel.

Hungerford.—The foundation-stone of a chapel of ease to the parent church of Hungerford has been laid at Eddington. The site, an elevated one, on the east side of the turnpike road leading to Hungerford and Newtown, had been presented by Mr. W. Honywood, of Chilton Lodge. Mr. Thomas Wooldridge was the contractor. The edifice is erected in the Gothic style of architecture from the design of Mr. A. W. Blomfield, of London, the material being coloured brick with Bath stone dressing. The length of the building is 84 ft., and the width 37 ft., and it consists of chancel, nave, and south aisle, the latter being divided by stone pillars, with carved capitals and brick arches. There are open benches of stained deal, affording accommodation for 250 persons, but on an arrangement with chairs, the building would comfortably contain a congregation of nearly 350. The east window is painted, the subject being "The Ascension;" it was inserted as a memorial of the late Mr. Michell.

In the chancel are other windows of painted glass, whilst the body of the church is lighted by seven windows with mullions and tracery. The main roof is open-work, and plain; that of the chancel, however, is decorated with emblems of the Passion. In the chancel are stalls for the clergy and the choir, and the flooring consists of Minton's tiles.

Books Received.

On Aniline and its Derivatives. By M. Riemann, P.D., &c. With an appendix. Revised and edited by William Crookes, F.R.S., &c. London: Longmans, Green, & Co. 1868.

This is a practical treatise on the manufacture of aniline and aniline colours. It relates entirely to the actual state of the manufacture as adopted on a commercial scale, and to the apparatus in use in manufactories. Such being the case, and although the book is a valuable and interesting one to chemists and manufacturers, it scarcely admits of quotation here, curious and interesting to all though the subject of the beautiful colours and dyes got from coal tar be. The appendix contains the report on the colouring matters derived from coal tar, shown at the French Exhibition, 1867, by Dr. A. W. Hofmann, F.R.S. There is also a useful index to the volume.

Miscellanea.

Monmouth Workhouse Competition.—Strong statements are made, even by one of the guardians, impugning the decision in this competition. Some of the competitors, we are told, have sent in a claim for compensation.

Moulders and their Regulations.—At the Barnsley County Court, George Holden, a moulder at the Thorncliffe Iron Works, sought to recover the sum of 3*l.* 2s. 11d. from Messrs. Newton & Chambers. It appeared that the amount claimed had been stopped by the defendants from the plaintiff's wages, in consequence of his casting some 18-in. pipes over a given weight. The plaintiff contended that it was not usual to deduct anything from pipes of that size; whilst, on the other hand, the manager produced the books to show that it had been a rule at the works for forty years. The judge gave a verdict for 17s., which was admitted.

The Sewerage and Water Supply of Gibraltar.—The works of the main outfall are finished, and the house drainage is being begun. The works for conveying the water from the "Inundation" into the town are making rapid progress. During the operation of driving a tunnel from the Landport ditch towards the Inundation, fresh water has been encountered in abundance soaking through from numerous springs. An estimate of the amount of these soakages, both in the tunnel and in another open cutting connected with the same works, has been made, and it is found to yield 1,436 gallons per hour. If it should prove that this stream is continuous, the great problem of the water supply of Gibraltar will be solved, and incalculable advantages must accrue to the whole community. All theories of the geological conditions of the Rock, according to the local *Chronicle*, seem to point to the existence of a large system of internal watersheds.

The late Mr. Hassall, Sculptor.—Richard Hassall was born on his father's farm, near Leek. He inclined more to art than agriculture; and at the age of twenty-five entered the Macclesfield School of Art, where he made progress, gained medallions and ultimately became an art pupil teacher. Leaving the school at thirty, for two years he devoted himself to wood-carving, stone-cutting, and sculpture. Macclesfield had a poor appreciation for such business, and insufficient patronage drove him nearly to the verge of despair. Two years and a half ago, the head designer and sculptor of the South Kensington Museum died—a man of great ability—and Mr. Hassall was sent for to strengthen the staff there; where he gained the esteem of all who knew him, and his productions were considered of great promise. Last week he died, just as he might have hoped to make his mark. Another designer and modeller (of South Kensington), Mr. Gibbons, was unfortunately drowned a few days ago.

A Receipt for your Letters.—M. Replovsky, deacon of the Russian church at Stutgard, has presented to the Post-office of administration of St. Petersburg a letter-box, organized in such a way that the person who deposits a letter in it receives immediately a ticket showing the year, month, and day of the act. A commission appointed to examine the invention has found it perfectly practical and well suited for the object proposed.

Memorial of Talfourd.—A memorial tablet, executed on British plate-glass of large dimensions, has been placed in the Philanthropic Lodge, No. 9, in the town of Reading, to the memory of the late Judge Noon Talfourd, who was a great supporter of the institution. The memorial consists of the arms, crest, and motto of the deceased judge, within an elaborate border. The work is the production of Mr. Thomas Mills, of London, who has just filled the east, west, and south chancel windows, for the church of Pitchcott, near Aylesbury, with stained glass. From the same factory were lately shipped fourteen stained-glass windows, for the church of the Holy Trinity, Port Elizabeth, Cape Town, consisting of figures, emblems, and geometrical patterns, in the style of the fourteenth century.

Architects and the "Royal Engineers."—A few young men are wanted to serve in H.M.'s Royal Engineers, and so bills are stuck about Devonport, showing to what trades they must have been brought up. The bill ends thus:—

"Men of the following trades are required in limited numbers only, such as,—

Shoemakers, height,	5 ft. 6 in.
Fitters	ditto.
Surveyors	ditto.
Clerks	ditto.
Architects	ditto.
Painters	ditto.

Rate of pay, from 3s. 6d. to 7s. 6d. per diem, according to grade and qualifications of trade."

This is rather good news for the rising generation of architects. They now know, and it is not the first time it has been announced in a similar way, that such of them as measure not less than 5 ft. 6 in. may get, in her Majesty's service, from 3s. 6d. to 7s. 6d. per day, according to qualifications; provided always that there are not too many of them striving for the post. This is certainly encouraging.

Preservation of Butchers' Meat.—It seems that Dr. Dewar's patented process for preserving fresh meat, by means of sulphurous acid, was successfully tried in Abyssinia. At a public meeting, not long since, in Sydney, resolutions were passed to raise 9,000*l.* or 10,000*l.*, in order to aid a projector in his first experiment for the supply of the English market with Australian meat; and there is said to be every prospect of 300 tons of beef and mutton being soon despatched. We are told that a gentleman in Sydney has discovered a ready and harmless means of freezing the meat. Gases liquefied by pressure absorb an immense quantity of heat, or create an intense cold, when released from this condition. Such gases are introduced between the outer and inner cases of a double cylinder, and (by their release, we presume) the temperature of the inner cylinder can thus be reduced to 100° below zero. Within the inner cylinder the meat is packed, and therefore it never comes in contact with the gas at all. In twelve hours, it is said, 100 tons of meat may thus be completely frozen.

Sanitary Report on Marylebone.—The monthly report of Dr. J. Whitmore, the medical officer of health for the parish of Marylebone, has been issued. As compared with the death-rate of June last year, we find in the present return an increase of 2·8 per 1,000, and which is mainly attributed to the increased mortality from diarrhœa. The sickness returns also give 1,217 new cases of this disease, whilst in the same month last year they were only 645. The unusual prevalence of diarrhœa at the present time is attributed, first, to high temperature; secondly, to rapid decomposition of animal and vegetable matter consequent thereon; thirdly, to sleeping in overcrowded and ill-ventilated rooms under such a temperature; fourthly, to an unusual quantity of unsound fruit; and, lastly, to utter disregard of all care in diet and personal cleanliness among the poor population. To these causes the extraordinary dryness of the season ought especially to have been added, as rain is requisite to wash away the decomposing matter of a hot season. The shameful state of the dustbins of some of the better class of houses is adverted to.

Wimbledon Local Board.—The Wimbledon Local Board have elected Mr. Chas. Bird, C.E., to the office of surveyor, *vice* Mr. Bryceson, who has resigned.

Water.—Sir: During this hot weather pumps in and about London are besieged for the cool refreshing water in the wells. I would caution people not to drink this water, for I have no doubt that sewage percolates into the wells from adjoining sewers and drains. The gravel beds through which the sewage passes may remove the mechanical, but certainly not the chemical impurities. Some years ago people were seized with cholera from drinking water from wells and cisterns polluted with sewage. Housekeepers should also thoroughly wash out and clean the house-cisterns, which generally contain a muddy deposit from the water supply. People are often seized with diarrhœa from drinking water drawn from foul cisterns.—J. P.

Curious Discovery of a Fire.—The inmates of Barlow Hall, near Selby, a large old-fashioned house, were recently aroused from their slumbers by the discharge of firearms, evidently inside the house. The master of the house, a Mr. Bailey, and his servants at once proceeded downstairs, when they found the kitchen in flames. An alarm was given, and the neighbours rendering every assistance, the fire was confined to that portion of the house. On an examination being made it was found that a beam in the chimney had been ignited, probably the evening before, and the fire had communicated with other portions of the house, including a closet containing three loaded guns. These were discharged on becoming heated: hence the discovery of the fire.

Improvement of Workington Harbour.—In accordance with a plan prepared by Mr. Rendall, engineer, the trustees of the harbour of Workington, with the consent of Lord Lonsdale, have commenced a work which has long been greatly needed, namely, the improvement of the entrance channel to their harbour. For a great length of time, owing to the accumulation of gravel on the south side, the channel has been so narrow as to render its navigation dangerous, and during storms almost impossible. The old pier is to be extended 60 ft. The extension of John's Pier is not at present contemplated, but in order to arrest the travelling beach, three groins are to be put up to the westward of John's Pier. Workmen are also engaged at low water in deepening the entrance to the Lonsdale Dock.

The New Law Courts.—In reply to Mr. Alderman Lawrence, the Chancellor of the Exchequer has stated that the plans of the New Law Courts will be settled by the Treasury, with the consent of the Commissioners. With regard to the funds, the Act of Parliament provides that 200,000*l.* be voted in consideration of the surrender by the Government of the buildings by the side of Westminster Hall now occupied by the Law Courts; 1,000,000*l.* were to be contributed from the surplus interest fund of the Suitors' Fee Fund; and the rest was to come out of a fund to be provided by fees paid by suitors, other than those in the Court of Chancery, extending over a period of fifty years. He could not say whether the contracts would be submitted to Parliament, as the final plans had not yet been decided on.

Twenty-one Houses Burnt Down.—A couple of very destructive fires took place in Devonshire on Saturday and Sunday, part of two remote villages being razed to the ground. The disaster was in each case owing to the ignition of thatched roofs, which in the excessively dry weather are very inflammable. At Colyton ten houses were burnt down, most of the furniture being destroyed; none of it insured. At Collumpton eleven houses fell a prey to the flames, which were increased by a large quantity of oils and spirits lodged in the house where the conflagration broke out. The tinder-like roofs of a whole row of houses were in a blaze at once, and the fire brigade had no chance of extinguishing the flames. Water was obtained from the town lake, but it proved inadequate to the occasion. There was no time to save the furniture, and in one or two instances the inmates barely escaped with their lives. There had not been so great a fire in Collumpton since the disastrous calamity of twenty-five years ago, when, also in the month of July, 151 houses were destroyed, the fire originating in a flash of lightning. How the fire on Saturday and Sunday originated is a mystery. The total damage caused is estimated at 5,000*l.*

Society of Gray's Inn.—The whole of the property of the Honourable Society of Gray's Inn is now undergoing an external repair, under the new surveyor, Mr. Lewis H. Isaacs. The contractors for the works are Messrs. J. Simpson & Son.

Longton Cottage Hospital.—This hospital has been inaugurated. It has been built at a cost of between 600*l.* and 700*l.*, about 130*l.* of which have been contributed by the working classes. Numerous gifts of furniture and other necessaries for a hospital have been made, and the institution will now soon be in complete working order. The new building is erected near the mission schools at Mount Pleasant. It has a very neat exterior, whilst inside its appearance is cheerful and comfortable. Besides eleven bedrooms on the first-floor, there are, on the ground-floor, the sick wards, surgery, bathrooms, icehouse, and other accommodation, which will be further developed according to the requirements of the town. At present accommodation is provided for four men, four women, and a number of children, and the patients will be attended by skilled nurses, and the best medical skill in Longton.

TENDERS.

For the erection of residence and warehouse, Belvedere-road, Lambeth, for Messrs. Bartram, Thomas, & Prout. Mr. Lacy W. Ridge, architect :—

Adams & Sons	£1,758 0 0
Newman & Mann	1,686 0 0
King & Sons	1,580 0 0
Scrivener & White	1,511 0 0
Prout	989 0 0

For the erection of a workhouse and outbuildings, &c., at Llanerchymedd, for the guardians of the Anglesey Union. Mr. R. G. Thomas, architect :—

Griffiths	£2,246 10 0
Chester (accepted)	1,925 0 0

For the erection of the County Court and offices, Cheltenham. Mr. T. C. Sorby, architect :—

Billings & Sons (accepted)	£6,300 0 0

For building a house in Newton-road, Faversham, for Mr. T. Gillett. Mr. B. Adkins, architect :—

Creed	£1,412 0 0
Brattle & Shoebridge	1,326 0 0
Epps	1,222 6 0
Austin	1,193 0 0
Sollitt	1,130 0 0
Shrubsole (accepted)	1,089 0 0

For house at Caterham. Mr. P. Webb, architect :—

Wells	£3,095 0 0
Colls & Son	2,584 0 0
Ward	2,584 0 0
Foster	2,578 0 0
Turner	2,549 0 0
Sharpington & Cole	2,497 0 0
Regis	2,489 0 0

For villa residence at Walton-on-Thames. Messrs. Bacon & Bell, architects :—

Jackson & Shaw	£3,095 0 0
Patman & Fotheringham	2,998 0 0
Nicholson	2,980 0 0
Francis	2,940 0 0
Higgs	2,923 0 0
Sharpington & Cole	2,877 0 0

For the erection of warehouse, Vine-street, Minories. Mr. R. Tress, architect :—

Johnson	£1,040 0 0
Shaw	1,018 0 0
Newman & Mann	996 0 0
Ramsey	973 0 0
Brewster	951 0 0
Sewell & Son	938 0 0
King & Sons	936 0 0
Cohen	910 0 0

For alterations and additions to 122, Pall Mall. Mr. H. H. Collins, architect :—

Shaw	£845 0 0
Sale	842 0 0
Ball & Russell	595 0 0

For rebuilding Nos. 52 & 53, Newgate-street. Mr. J. Coe, architect :—

Turner & Sons	£3,087 0 0
M'Crae	2,850 0 0
Morter	2,743 0 0
King & Sons	2,586 0 0

For a warehouse in Cloth-fair, Smithfield. Messrs. Haywood & Blashill, architects. Quantities supplied by Mr. D. Cubitt Nichols :—

Clemence	£1,487 0 0
Ennor	1,369 0 0
Beeton	1,297 0 0
Scrivener & White	1,289 0 0
Tully	1,285 0 0
Newman & Mann	1,236 0 0
Hill, Keddell, & Waldram	1,225 0 0
King & Sons	1,161 0 0

For alterations and additions to premises, Hampstead-road, for Mr. John Oetzmann. Mr. C. Eales, architect :—

Corsman	£3,700 0 0
Bywaters	3,683 0 0
Fish	3,513 0 0
Clark & Co.	3,400 0 0
Manley & Rogers	3,287 0 0
Mann	3,275 0 0
Scrivener & White	3,027 0 0
Kelly Brothers (accepted)	2,974 0 0

Accepted, for the erection of a villa residence at Chesterfield, Derbyshire, for Mr. G. Naish. Mr. S. Rollinson, architect. Quantities supplied :—

Mason's, &c., Work.	
Austin	£488 0 0
Joiner's, &c., Work.	
Ellis	277 0 0
Slater's Work.	
Marjerrison	37 7 6
Plumber's, &c., Work.	
Gothard	110 0 0
Plasterer's Work.	
Roper	63 0 0
Smith's Work.	
Oliver & Co.	22 0 0
Painter's Work.	
Slack	19 10 0

Accepted, for the erection of school, &c., at Whalley, Derbyshire, for the Rev. T. C. Hills. Mr. S. Rollinson, architect :—

Masons', &c. Work.	
Wragg & Dearnley	£200 0 0
Joiner's, &c., Work.	
Langley	190 0 0
Slater's Work.	
Marjerrison	30 0 0

For building two shops and stabling, High-street, Shadwell, for Mr. Wood. Mr. C. Dunch, architect :—

Newman & Mann	£1,796 0 0
Macey	1,789 0 0
Kilbey	1,771 0 0
Prichard	1,717 0 0
Johnson	1,695 0 0
Rivett	1,692 0 0
Ennor	1,629 0 0
Hearle	1,487 0 0

For additions and alterations to the Horns and Chequers public-house, for Messrs. Taylor & Walker. Mr. C. Dunch, architect :—

Rivett	£983 0 0
Johnson	855 0 0
Morter	783 0 0
Kilbey	756 0 0
Hearle	739 0 0

For new infirmary and casual wards, &c., at Wandsworth and Clapham Union. Messrs. Beeston, Son, & Brereton, architects. Quantities supplied by Mr. James Barnett :—

Patman & Fotheringham	£43,295 0 0
Mansfield, Price, & Co.	42,551 0 0
Perry & Co.	42,179 0 0
Higgs	40,718 0 0
Ashby & Sons	40,670 0 0
Macey	40,592 0 0
Browne & Robinson	40,500 0 0
Kirk & Parry	40,530 0 0
Downs	40,196 0 0
Piper & Wheeler	39,940 0 0
Rider & Sons	39,790 0 0
Aviss & Sons	39,497 0 0
Easton Brothers	39,200 0 0
Nicholson	39,168 0 0
Adamson & Son	38,897 0 0
Myers & Son	38,807 0 0

For alterations and repairs to three houses, Nos. 136, 137, & 138, Sloane-street, Chelsea, and building three stables at rear, for Messrs. Roope. Messrs. H. Jarvis & Son, architects :—

Hart	£4,687 0 0
Higgs	4,529 0 0
Macey	4,302 0 0
Henshaw	4,196 0 0
Turrell Brothers	4,121 0 0
Tarrant	4,000 0 0
Thompson	3,920 0 0
Richardson	3,663 0 0

For draining an estate at East Greenwich, for Mr. Coles Child. Mr. Thomas Dinwiddy, architect :—

Pearson	£630 0 0
Disney	610 10 0
Nunn	557 15 0
Featherstone	502 0 0
Nowlan (accepted)	498 0 0

For new shop-front, for Mr. Hall, Swindon. Mr. T. S. Lansdown, architect :—

Lovatt	£252 10 4
Barrett (accepted)	245 8 8

For the erection of four houses in the Ladbroke-road, Notting-hill, for Mr. T. H. Scarborough. Messrs. E. Habershon, Brock, & Webb, architects :—

Manley & Rogers	£4,200 0 0
Temple & Foster	3,900 0 0
Ruskin	3,800 0 0
Macers	3,614 0 0
Mildwater	3,315 0 0
Johnson	3,220 0 0

For works at Fittleworth Rectory, for the Rev. Mr. Cattley. Messrs. Waring & Nicholson, architects :—

King	£412 0 0
Nightingale	359 0 0
Habbing	348 0 0

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We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Advertisements cannot be received for the current week's issue later than **THREE o'clock p.m.**, *on THURSDAY.*

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